THE ENGINEERING AND MINING JOURNAL.

RICHARD P. ROTHWELL, C. E., M. E.
ROSSITER W. RAYMOND, Ph. D. } Editors.

NOTE.—Communications relative to the editorial management should be addressed to Mr. ROTHWELL. The articles written by Mr. Raymond will be signed with a star.

CONTENTS.

EDITORIALS :
American Institute of Mining Engineers..... 165
Blast Furnace Practice in Eastern Pennsylvania and New Jersey..... 165
The East River Suspension Bridge.... 165
New Publications..... 165
The American Mining Stock Board of New York..... 166
Gold Exhibits at the Philadelphia Exhibition.—III..... 167
English Manufacturers Removing to America—Export Progress..... 167
Some Things that Influence the Production of Carbonic Acid in the Blast Furnace..... 168
Project for the Erection of Blast Furnaces in New Jersey..... 168
The Sulphur Mines of Italy..... 169
Gold in Texas..... 170
Japanese Porcelain..... 170
Abstracts of Lectures on Mining—No. II. 171
Admissions to International Exhibition.. 172
Notes..... 172
The Andover Iron Company..... 172
The Bethlehem Iron Company..... 172
New Nickel Deposits in Spain..... 172
Lake Hinslie Oil Wells..... 172
Crane Iron Company..... 172
A Large Steel Wire Cable..... 172
Coal Mines Caving in..... 172
Boonton Iron Works..... 172
On the Stopping up of the Regenerators in Siemen's Furnaces..... 172
Report of British Commission on Spontaneous Combustion of Coal 172
Colorado Mines..... 172
Mining Notes from Colorado, Georgia, Michigan, Utah, and Mexico..... 172
STATISTICS OF COAL PRODUCTION.. 173
COAL TRADE REVIEW 173
IRON MARKET REVIEW..... 176
METALS..... 176
FINANCIAL :
New York Stocks..... 177
Philadelphia Stocks..... 177
Gold and Silver Stocks..... 177
Copper Stocks..... 178
Gas Stocks..... 178
Advertisements..... 179

AMERICAN INSTITUTE OF MINING ENGINEERS.

AUTHORS of papers read before the Institute are entitled to twelve copies of the ENGINEERING AND MINING JOURNAL containing their papers. These copies will be sent on application to the office of the Journal, or the Secretary of the Institute, immediately after the appearance of the papers. Back numbers cannot always be supplied.

EASTON, Pa. THOMAS M. DROWN, Sec'y.

BLAST FURNACE PRACTICE IN EASTERN PENNSYLVANIA AND NEW JERSEY.

THE paper on the construction of blast furnaces in New Jersey, of which we commence the publication this week, was the graduating thesis of Mr. WM. KENT, at the Stevens Institute of Technology. It is a paper of very considerable merit, and has a special interest in giving the actual average results of blast furnace practice at several of the principal works in New Jersey and Eastern Pennsylvania. It is a professional contribution of much greater value than can generally be expected among graduating theses, and reflects great credit on its author.

THE EAST RIVER SUSPENSION BRIDGE.

THE first wire of this great bridge (1,600 feet clear span), was run over the piers on the 14th ult. The small cables for the temporary foot bridge are now being put in place and the work may be said to be fairly under way. There is still much opposition to the bridge, as obstructing navigation, its height, 135 feet in the center, necessitating the striking of top-masts even, in some ships. As the high grades required to get upon the bridge at its present elevation rendered it impossible to make it higher, it would undoubtedly have been better to have put a tunnel under the river, than to have interfered so seriously, as the bridge is likely to do, with the shipping interests on which the whole prosperity of the City depends.

NEW PUBLICATIONS.

HAND-BOOK OF MODERN STEAM FIRE-ENGINES. By STEPHEN ROPER, Engineer. Philadelphia : CLAXTON, REMSEN & HAFFELFINGER, 1876. 16mo, pp. 411. $3.50.

THERE are some peculiarities about this work which, to the credit of authors in general, it is believed, will be recognized as rare, if not original. If the book were to be read by a person who is not familiar with technical matters, he could scarcely fail to observe the variety of styles in which it is written, and he could hardly believe that it was the work of a single author, even though no credit is given for anything, with the exception of two tables relating to the strength of iron. On the other hand, a person having a tolerable acquaintance with technical literature, would be amazed, on opening this book, to see the evidences of barefaced piracy. It is scarcely possible, in writing a comprehensive work on the steam-engine, to have it entirely original—as much that is valuable and important is already in print. Few authors, however, object to have quotations made from their works, provided the proper credit is given, and no reputable writer is ever guilty of quietly appropriating the work of others, without a word of acknowledgment. Mr. ROPER does not appear to be troubled by any such scruples. All is fish that comes into his net. Not only does he take original tables and formulæ, without a hint as to their authors, but in discussing a subject he inserts paragraphs from other writers, word for word, just as if he had written them himself. See, for example, pp. 149, 151, 175, 176, 178, 180, etc., which have been largely borrowed from AUCHINCLOSS's "Link and Valve Motions," etc., etc. It would only be a fair retribution if some of the authors, whose copyrighted works have been purloined, should inflict upon Mr. ROPER the penalties provided by law for such cases ; and it is questionable whether any other treatment would be appreciated by him. It must be evident that any one who gleaned, with judicious hand, the best things from technical literature already in print, could produce a very valuable work of reference. Great care is necessary, however, in joining the articles taken from a number of different sources, to form them into a consistent whole, and Mr. ROPER has failed to accomplish this, in quite a number of instances. This would not be a matter of so much importance, if the authorities for all important statements were quoted. As it is, however, all the tables and rules, whose origin is not given, must be equally doubted, until they have been checked, for a brief examination of them will convince any one that the book contains much that should not be taken upon trust. This may be best illustrated by a few examples.

A table of the expansion of air, on page 52, does not agree with the generally accepted statement that air expands 0·0020276 of its original volume, on being heated 1° Fahrenheit.

Water boils in a vacuum at 980° Fah. (p. 65), but, according to REGNAULT'S experiments, the vacuum in which this occurs has a pressure of nearly one pound per square inch.

On page 66 are two tables, evidently taken from different sources—as one gives the weight of a cubic foot of water at the temperature of maximum density as 62·5 lb., and the other as 62·408 lb. Neither of these values are correct, according to the best authorities, and the table of the expansion of water by heat does not seem to agree with the best experiments.

On page 67 is a table of the weight of water in one-foot lengths of pipes of various diameters. As the temperature of the water is not stated, a few calculations have been made to find what weight per cubic foot was assumed, with the following results :

Data for a		3	inch	pipe,	gives	61·11	lb.	as	weight	per	cubic	foot.
"	"	6	"	"	"	62·39	"	"	"	"	"	"
"	"	9	"	"	"	62·25	"	"	"	"	"	"
"	"	12	"	"	"	62·39	"	"	"	"	"	"
"	"	18	"	"	"	62·53	"	"	"	"	"	"
"	"	24	"	"	"	62·43	"	"	"	"	"	"

It is unnecessary to comment on the value of this table for general use.

Some tables of discharge of water, on pp. 77–81, are worthy of a few remarks. The first is for the theoretical discharge of water under various heads, in gallons, and the kind of gallons is not stated ; but any one, curious enough to calculate a few of the results, will see that they are imperial gallons. The second table, for a discharge of 8-10ths of the theoretical, also in gallons, kind not stated, may be found to give the data in U. S. liquid gallons. The third table is for the discharge from jets, in gallons, and as the result of a calculation, it appears that the discharge is 8-10ths of the theoretical, in U. S. liquid gallons. A fourth table, of the discharge from orifices of different sizes, under varying heads, appears to be the theoretical discharge in U. S. liquid gallons. As these important distinctions are not stated in the headings to the tables, and no examples are given to illustrate their use, the results of a set of calculations based upon them as they stand, might be more curious than valuable. Even where he introduces examples to illustrate the rules, however, Mr. ROPER is not always happy in observing the distinction between two measures of the same name ; notably, in some rules for the resistance of trains, pp. 161–163. Here the rules for resistance of trains on a level, is the one generally employed to give the result in pounds per gross ton ; but Mr. ROPER, in his examples, uses net tons, and having thus impressed the reader with the idea that it is net tons he is dealing with, adds a table for the resistance on grades, in pounds per gross ton. This table, it may be noted, is somewhat peculiar, the given data being the rise of one inch in a certain number of feet, and the rise per mile being computed from this, as if the given data were the rise of one foot in the same number of feet.

Quite a number of instances of inaccuracy and confusion of statement, some of them still more glaring than those already detailed, have been noted—but for lack of space, only one more will be given—and this is an example which fully illustrates the difficulty of drawing materials from everywhere, with the idea of forming a consistent treatise. There are three tables of the properties of saturated steam, pp. 338-341, which give very discordant values of the temperature and relative volume at different pressures—as will appear from two illustrations selected at random :

Absolute pressure in pounds per square inch.	1st and 2d tables.		3d table.	
	Temperature.	Relative volume.	Temperature.	Relative volume.
29	249°·6	911	248°·4	868
90	324°·3	325	320°·2	298

One of these tables is computed from REGNAULT'S experiments, and was originally published in a work which is regarded as very high authority—the "Encyclopædia Britannica"—where the data on which it was based were fully detailed. This example shows that there is good material in Mr. ROPER'S book—but it must be also evident that the good is in company with much worthless matter—and all of it is in disguise, so to speak, being put forward apparently as the offspring of Mr. ROPER'S brain.

It may occur to the reader, that if he is obliged to seek for the origin of every rule and table in this book, and must check those that he cannot find else-

where, the book will not be of much use to him, since he might as well depend upon the works which are required to verify this one.

In the portions of the book which seem to be undeniably original with Mr. ROPER, will be found a collection of nonsense that is unique. It will surprise many persons to learn that fire is an element; that very violent chemical alterations are necessary for combustion; that heat is a vehement combination of various materials; that fire, which is of itself an element, has hydro-carbons for elements; that the elements called hydro-carbons are composed of oxygen and nitrogen; and that when combustion takes place, the hydrogen in the combustible escapes uncombined. Some faith may be necessary to enable any one to believe these statements, but Mr. ROPER assures the reader that his long experience shows him just what kind of information is needed by engineers. If you want water, according to Mr. ROPER, you have only to make an excavation anywhere, which information, if true, would be valuable to many an agriculturist. There is some subtle difference between *heat* and *caloric*, in Mr. ROPER's view, heat being a sensation, and caloric "an expression of every conceivable existence of temperature," whatever that may mean. In his mechanical definitions the author makes some notable discoveries. He distinguishes between *net horse power*, or "the indicated horse power minus the amount expended in overcoming the friction," and the *dynamometrical horse power*, or "the net power of the engine after allowing for friction, etc." Captious people might say that both these definitions amounted to the same thing, and might fail to perceive the difference between what Mr. ROPER is pleased to distinguish as *nominal* and *indicated* horse power. It is to be noted that a slide valve is more wasteful of steam than other forms of valve, while at the same time, if properly designed, it is one of the "most effective devices ever invented."

It would be easy to continue this catalogue of select remarks to considerable length, but want of space forbids. It will be observed that although this book, according to its title, relates to steam fire-engines, various other engineering matters are detailed, because, as the author justly observes, a steam fire-engine is nothing but a steam engine after all. The portion relating especially to fires and fire-engines deserves some notice. It is apparently a compilation of various views on the causes of fire and means of prevention, with descriptions, tables of dimensions, and records of performance, of the different steam fire-engines manufactured in this country. Here the author was afforded a fine field for doing some really good work, and some that would have been exceedingly useful. It is to be regretted that his plan of depending upon others for his material could not have been foregone in this instance, for, as is well known, the principal literature relating to steam fire-engines is limited to the descriptive circulars issued by the different manufacturers, and it is quite as well known that such descriptions do not furnish the most reliable guide for an exact comparison. But these descriptions seem to have been Mr. ROPER's principal resource in making up his own, so that the value of them can readily be estimated. It will be difficult for any one who is not pretty well acquainted with the subject to gain much idea of the relative advantages and disadvantages of the different forms of engines. The fact that one has a "piston engine," another a "submerged smoke box," a third a "variable exhaust," will convey little idea to the ordinary reader, and the statement that one of the engines stands "quite still when working," seems to call for further explanation. It is difficult to reconcile the assertion that steam can be formed in the boilers from cold water in three or four minutes, with the statement that in practice, where the water is kept warm in the boilers, it requires from 10 to 12 minutes to raise steam. The tables of dimensions are perfectly worthless for purposes of comparison, as all data about tubes, heating and grate surface, are omitted, and in the tables of performance, no mention is made of such items as diameter of hose, kind of nozzle, and pressures in steam and water cylinders. Of what use is it to know, for instance, that one engine, with 100 feet of hose, threw a stream of 304 feet 3 in., while another only threw a stream of 267 feet, when, for anything stated in the report, the pressure might have been twice as much in one case as in the other? There is some pamphlet and periodical literature, relating to the performance of steam fire-engines, that Mr. ROPER might have collated to advantage, but the conclusion seems irresistible that, although he has a great capacity for acquiring material, he lacks the knowledge which would enable him to separate the chaff from the wheat.

It will be seen that the work under consideration does not warrant this extended notice, on account of its extraordinary merit. Indeed, a literary bandit like Mr. ROPER cannot fairly claim a hearing at all, and it is rather for the sake of those into whose hands the book may fall, that these remarks are written. It is a discouraging sign to see that persons who write books of this kind can get them published other than at their own expense, for their influence is wholly bad. Those engineers who have access to good libraries, will scarcely desire to refer to Mr. ROPER's work, and those who are forced to depend upon its statements, from want of knowledge or lack of other authority, will have indeed a blind guide. It may be, then, that these remarks will be of some slight benefit as a warning, and if so, their length may be excused. It is not always sufficient to dismiss a book of this kind with the simple remark that it is defective and inaccurate. Mr. ROPER has a certain or uncertain standing as an author, by virtue of having published several other works on engineering subjects. Some of these we have already had occasion to condemn in these columns. Since he repeats, under a more aggravated form, the offense, it has seemed desirable to show why his productions are defective and inaccurate.

PLANS OF MODERN ROLLING MILLS, AND DESIGNS FOR ROLLING-MILL MACHINERY. TOTTEN & Co., Pittsburg, 1876.

THIS is a handsome album, prepared and published by Mr. ROBERT C. TOTTEN of the well-known Fulton Foundry at Pittsburg. The plans and drawings, showing the arrangement of various leading Western rolling-mills, and the details of their machinery, are calculated to be of considerable service to mechanical engineers. They are not accompanied with any explanatory text; and the reasons of the peculiar arrangements presented by some of the mills must be sought by inquiry elsewhere. The builders of works frequently have to "cut their coat according to their cloth;" and the merit of a given design may lie in its adaptation to special circumstances. But every engineer knows the value of a collection of drawings illustrating contemporary practice; and we need not enlarge on the service which Mr. TOTTEN has rendered to the profession, in the publication of a work which will doubtless benefit no less the special business of his house. *

STEVENSON ON THE DHU HEARTACH LIGHTHOUSE. Edited by JAMES FORREST, Secretary of Institution of Civil Engineers, London.

SHOOLBRED ON THE CHANGES IN THE TIDAL PORTION OF THE RIVER MERSEY. Edited by JAMES FORREST, Secretary of Institution of Civil Engineers, London.

THE COMPLETE PRACTICAL MACHINIST. By JOSHUA ROSE. HENRY CAREY BAIRD, Philadelphia. Price $2 50.

This book will have further critical notice.

THE SCIENTIFIC MONTHLY: A Magazine Devoted to the Natural Sciences. E. H. FITCH, Editor and Proprietor, Toledo, Ohio. Price $3 a year.

This magazine seems to be doing a good work in a modest way. The number before us contains several articles of interest. Every periodical of this kind tends to advance the great cause of science, and, particularly, of popular science. We wish it success.

THE AMERICAN MINING STOCK BOARD OF NEW YORK.

WE have had a number of inquiries asking for information about this new stock board that has several times been mentioned in our weekly financial report. The new board has been fully organized by the election of officers, and will be prepared, within a month from this date, to commence calling stocks.

The following list of its principal officers will show the composition of the board. Most of them are gentlemen quite well and favorably known on Wall Street. Some of the names, however, we do not think are calculated to add any strength to the new organization.

President, WM. WARD; *First Vice-President*, LAWRENCE P. BAYNE; *Treasurer*, DANIEL BUTTERFIELD; *Secretary*, H. J. HUBBARD; *Assistant-Secretary*, WALWORTH WARD; *Chairman Arbitration Committee*, WM. M. BURGOYNE; *Executive Committee*, GABRIEL NETER, FRANCIS B. FORSTER, JOHN F. SCOTT, GEO. P. TOWNSEND, DANIEL BUTTERFIELD, JOSEPH T. THOMPSON, and ANDREW L. THOMPSON.

The objects of the Mining Stock Board are to facilitate transactions in mining securities, and to encourage investment in this class of property—objects with which we are fully in sympathy. Whether it will attain these ends or defeat them, will depend on the manner in which the business is conducted.

There can be no doubt whatever that good mining property offers a much more remunerative field for the investment of capital than any other; at the same time, from the very nature of the case, there is a greater risk from deception, and the foisting off of worthless property on beguiled stockholders, than in any other class of investment. So few of those interested in mines know anything about them, that, in Gold and Silver Stocks, at least, the buying and selling prices are dependent much more on skillful manipulation of the market, than on the yield of the veins, or the skill with which they are worked. Of the thousands who deal in Bonanza Stocks in San Francisco, only those who control the mines know what the real value of the security is. The danger here—which is neither greater nor less than in San Francisco—is, that this market, after being properly prepared by some months' transactions in dividend stocks, will be flooded with "Bonanza" shars, when the limits of the great pocket have been ascertained, and, consequently, when the stock is about to cease paying dividends or to have a value.

The transactions of the last New York Mining Stock Board have not been forgotten. It contributed, more than any other cause, to bring mining investments into disrepute in the East, for it was made the agent for floating all kinds of swindling enterprises. We trust the new Mining Board will carefully avoid these quicksands and the high personal character of the President of the Board, and of many of the gentlemen connected with it, gives us good reason to hope that nothing but what is reputable and honest will have the endorsement of the Board, by receiving its official recognition.

We shall note with care the working of this Mining Board; and while its objects have our cordial support, we shall not hesitate to point out its shortcomings, should it, unfortunately, relapse into the devious ways of its predecessor

To investors we shall endeavor to supply, through our corps of special correspondents (who are experts in mining and metallurgy), such information as will enable them to estimate, with some degree of accuracy, the value of their investments. In this way we may supplement the good intentions of the Managers of the American Mining Stock Board, and help to prevent the floating of worthless, not to say dishonest, enterprises on this market.

GOLD EXHIBITS AT THE PHILADELPHIA EXHIBITION.—III.

Special Correspondence of the Engineering and Mining Journal.

(*Continued from page* 151.)

NEW SOUTH WALES.

THE yield of gold from this colony has only been second to that of Victoria, among all the English gold-producing countries. The amount obtained between 1851 and 1874, of which any account has been kept, is 8,205,232 ozs., having a value of $167,949,355. A gilded model to represent this amount is exhibited in the New South Wales Court in the Main Building, where are also her other mineral displays.

Among the exhibits of native gold, there is a case containing forty-five specimens of alluvial gold, some of which are in grains weighing an ounce or more. The gold in nearly all the specimens looks pure, only a few of them being mixed with titaniferous black sand. In a case placed on a mineral trophy which has been erected in this court, are shown a large variety of gold bearing specimens from different lodes throughout the country. A specimen of auriferous brown oxide of iron, from the Alfredtown mines near Wagga Wagga, is contained in this collection. This ore is essentially a limonite, and looks like bog ore. Nearly all the specimens of auriferous quartz shown have associated with them more or less oxide of iron, the iron occurring embedded in the quartz or deeply staining the natural fractures. A specimen of gold quartz from Mitchell's Creek, near Wellington, is laminated with iron pyrites. The quartz specimens from near Braidwood are all highly charged with iron pyrites, the gold apparently occurring in combination with the pyrites.

Many of the other specimens shown are highly charged with the same objectionable mineral, and the successful working of them has required much experience within the last few years. They have, however, the merit of yielding considerable gold per ton of ore, the specimens from the Braidwood district being taken from veins which average from 8 to 12 ozs. One thing to be noticed about these specimens is the comparatively shallow depths at which nearly all of them have been obtained, the distances seldom exceeding 125 feet. The ferrous oxide seen on many of them has, probably, resulted from the oxidizing of iron pyrites by surface influences. Unlike the Victorian quartz ores, the New South Wales specimens are not generally impregnated with other sulphurets than that of iron. Exceptional specimens from Braidwood and Forbes contain arsenical pyrites and galena. Quite a number of specimens of auriferous gravels and cements are shown in the same cases. One of these is a compact greenish-yellow cement from the Cudegong River, which contains a large amount of silicate of iron. Wash dirt, from near Forbes, is a dark ferruginous clay, with intermingled pebbles. Another specimen from the same locality is a lighter colored clay containing no gravel.

Two photographs, which are placed on the model of gold before spoken of, give a good idea of some remarkably rich specimens of gold which have been found in the Buyers and Holtermans claim. One photograph represents an arrow-shaped mass of quartz, 4 feet 7 inches high, 2 feet 2 inches wide at the bottom, and averaging 4 inches in thickness. The quartz is impregnated in every direction by irregularly foliated and segregated masses of gold. The whole specimen weighs 630 lb., and is valued at $60,000. The other photograph represents seven smaller but richer specimens, the rock surrounding the gold masses being colored green, probably to represent interlaminated slate rock. These specimens yielded about $30,000 in gold. Another photograph represents six pieces of retort gold—the result of one crushing from the same mine—the aggregate weight of which is 14,977 ozs., having a value of $310,000.

The principal gold-bearing districts of New South Wales lie in a belt of country about 180 miles wide, commencing at the south-east corner of the territory and running north about 380 miles, or to the 32d parallel of latitude. Several other gold fields are found in the north-eastern part of the colony, which are included between 29° and 32° latitude, and 150° to 153° longitude east from Greenwich. To the east of the Silurian formation, in which the principal gold fields are found, is the quite large coal district of which Sidney is the commercial center.

The principal sources from which New South Wales has as yet produced her gold are alluvial washings. This is due, in a great measure, to the less promising nature of the quartz lodes discovered when compared with those of Victoria, and also to the occurrence of pyriferous material with the gold in the quartz. The introduction of special apparatus for the treatment of these ores has already commenced, and will probably soon stimulate the working of gold veins to a considerable extent.

Some work in this direction has already been done, notably in the district lying around the town of Forbes, which latter place is situated about 175 miles west of Sydney. Six lodes were worked in this district in 1874, some of them, however, but superficially. The most systematic working was carried on by the Dayspring Gold Mining Company, which crushed in that year 5,674 tons of quartz. This yielded 3,158 ounces of gold valued at £3 7s. 6d. an ounce. The depth of the mine was 250 feet, and the thickness of the lode, which was a compact quartz, was 2 feet 6 inches. The entire cost of mining and extraction was £1 11s. 2d. a ton, which, taken from the gold obtained, £1 18s. 3d., leaves 7s. 1d. per ton as net profit.

The principal operations in the district are confined to alluvial mining, the yield for 1874 having amounted to 51,161 ounces, of which about 4,000 ounces resulted from quartz crushing. The district in which the alluvial deposits have been worked is confined to a strip of country a few miles wide and extending north from the town of Forbes about 19 miles. Some portions of the surface of the country have been much disturbed by igneous action. The Silurian slabs and shales have been upheaved, distorted, and often broken by intrusive masses of granite and trap. The fissures thus produced have, in many cases, been filled by veins and threads of quartz and calcspar, which are frequently found to be auriferous. Other portions of the district which have not been disturbed show veins of quartz of considerable size imbedded in the schists, but they are not generally metalliferous. A band of argillaceous limestone traverses the whole district from the Lachlan River, which flows from east to west through Forbes to the northernmost workings yet discovered. On either flank of this belt of limestone the most important leads yet discovered have been found. Surface indications are generally found in the hollows and gullies in this limestone ridge, but when the levels of the plains below are reached the pay dirt is generally covered with considerable deposits of more recent alluvial formation. The depth of these alluvial deposits on the pay dirt seldom exceed 150 feet. The thickness of the pay streaks varies from 12 to 24 inches. In 1874 126,200 loads of dirt were puddled and sluiced in the district at an average cost of 3s. 3d. per load. The yield of gold averaged 7 dwts. 14 grs. per load. The total amount of gold produced in the colony during 1874 was 270,823 ounces, having a value of £1,040,328.

QUEENSLAND.

The mining of gold in this colony is of comparatively recent date. About 1868 the gold deposits of the colony began to be worked, since which time, and up to 1876, the amount produced has been 65 tons 41 pounds and 6 ounces, the value of which, in round numbers, is estimated at $35,000,000. Unlike in New South Wales, the gold mined is now largely obtained from quartz workings, the alluvial deposits hitherto found having been generally shallow and easily exhausted; most of the districts in which gold has been found are scattered along the eastern side of the colony, from latitude 15 to 29. Four other districts have been found on the west side of the long range of mountains which runs through Queensland from south to nearly north. The districts on the eastern side of this range are twelve in number, which, with the others, makes a total of sixteen. The most productive of all the districts yet worked is the Gympie, which has produced, since the first discovery of auriferous deposits in 1867, up to 1875, 380,825 oz. of gold, having a value of £1,332,872.

Eighteen fine quartz specimens, containing gold from different mines in this district, are exhibited in the Queensland Court, in the Main Building. Nearly all of these are very rich, and are, undoubtedly, hand-picked specimens. The rock is a nearly pure quartz, in which the gold occurs both in small and large pieces. One of the specimens, which has been cut across and polished, shows a nearly solid mass of gold of several square inches in section, which is intersected and traversed in a number of places by veins of quartz. Another specimen shows the gold in thin but quite large plates scattered through the quartz. The large specimen just spoken of, and several others, are quite light colored, showing that the gold is alloyed with a considerable amount of silver. Returns given from the Monkland Mine in this district, show that since the workings were commenced 7,028 tons of quartz were raised and crushed, which yielded 28,572 oz. of gold. Of this amount 24,496 oz. have been obtained between May 1, 1872, and Dec. 18, 1874. The lowest depth reached in this mine up to Jan. 1, 1875, was 372 feet. Another important district from which a number of specimens have been sent is the Ravenswood.

This district lies a little south of parallel of latitude 20° and is crossed by the meridian of longitude 147° west of Greenwich. The ores found in this district are highly pyritiferous and much of the gold on this account is not saved by the present methods of working. A map which is exhibited of this district shows the lodes to have a nearly north and south strike. The veins are generally inclosed in a country rock of syenitic granite.

The Elphinstone Creek which runs through the district furnishes water to a number of washing machines. Quite a number of specimens of the pyrites containing gold which have been separated by these machines are also exhibited. These contain from 2 to 18 ounces of gold per ton, which, by suitable treatment, can be nearly all extracted. The yield of gold from this district is about 20,000 ounces per year, there being 64 stamps in all. The Charters Towers district, which is situated about 100 miles south-west of the town of Townsville, which is on the east coast, produced in 1872 62,345 ounces of gold with a battery power of 79 stamps.

The Etheridge gold district lies about 350 miles north-west of Townsville, and is on the west side of the mountains. It produces about 25,000 ounces of gold per annum, which amount could be much increased were the mines to be more rigorously worked.

The Palmer gold district is situated on the western slope of the coast mountains at parallel of latitude 16. At this point the mountains make a semicircular bend towards the east and the Palmer field is located along the southern slope of the mountains. The gold workings in this district are unlike those in other portions of the colony by being almost wholly alluvial. In 1875 over 150,000 ounces of gold were obtained in the district, the whole of which was gained by washing. A number of vials containing specimens of gold from the alluvial deposits of this and other districts are exhibited in the Queensland court. They apparently vary much with regard to the silver alloy which they contain. Nearly all these specimens are in coarse grains or small nuggets, some of which are but slightly abraided. The gold found in one locality is in the form of wire-like grains, some of which are 1½ inches long.

Reports which have been rendered for 1873 show that in that year the total amount of quartz crushed was 80,064 tons which produced 139,527 ounces of gold, or 1 oz. 14 dwt. 20 grs. per ton.

SOUTH AUSTRALIA.

The discoveries of gold in this colony have as yet been unimportant. The large extent of territory comprised within the limits of the colony, being altogether about 906,784 square miles, is as yet a comparatively unexplored region, and it is perhaps due to this fact that more gold has not been discovered.

The colony, which extends through the center of the Australian continent from north to south, dividing West Australia from Victoria, New South Wales and Queensland, has been found to contain gold deposits in the ranges near the north coast. Some quartz specimens from these veins are exhibited in the South Australian display in the Main Building. A few of these specimens are quite rich in free gold, but they cannot be considered as representative of the mines from which they have been taken, as the total production of gold from the colony has only been about 2,100 ounces, having a value of $40,295.

TO BE CONTINUED.

ENGLISH MANUFACTURERS REMOVING TO AMERICA.—It is announced that J. P. CHENEY & Co., proprietors of the Sheffield (England) Cutlery Works, have decided to remove their business to Syracuse, N. Y. SANDERSON BROTHERS & Co., large manufacturers of steel in Sheffield, have, it is said, also completed negotiations for the establishment of a branch steel manufactory in Syracuse, having purchased the old "Sweet Works," a pioneer manufactory of steel in this country, which is now being enlarged and fitted for the new business.

EXPORT PROGRESS.—The export movement is going on bravely. Though shipments of manufactures have not increased of late so rapidly as to make any material difference in the weekly tables of aggregate values, the sentiment is spreading among manufacturers that this is the only permanent remedy for the present depression, and the first steps have been taken in many trades looking to a very great expansion in export business. The action of our cotton manufactures in sending samples of their goods, with details of prices, &c., to the chief foreign countries, through the commissioners at the Centennial, is particularly important. We have frequently of late chronicled some enterprising move of the Fall River manufacturers in the same direction. The statement that 4,500 bales of domestics—the largest shipment of the kind since the war—will be exported next week to Shanghae is significant. Our manufacturers are also bestirring themselves in the matter of sending agents abroad. And it is by no means confined to the makers of cotton goods. In the iron and hardware trades considerable interest in the foreign outlet has been manifested, which has been increased by the collapse of the coal combination, which will enable our manufacturers to compete with those of foreign countries on somewhat more favorable terms than of late.—Boston *Commercial Bulletin*.

SOME THINGS THAT INFLUENCE THE PRODUCTION OF CARBONIC ACID IN THE BLAST FURNACE.*

By Charles Himrod, Youngstown, Ohio.

IN presenting this paper, it is not intended to enter into any discussion of the theory of the blast furnace, but simply to give the results of a number of determinations of CO and CO_2 in furnace gases, and some conclusions arrived at, and the result of an experiment made in hopes of increasing the production of CO_2.

In the first table is given the averages of a number of analyses of gases of different furnaces, and in the second, of two stacks of different sizes under varying circumstances :

Furnace.	Height of stack.	Cubic contents of stack.	Cubic feet per ton of iron in 24 hours.	Temperature of blast C.	Proportion of coke, by weight.	Proportion of Rolling Mill cinder in charge.	CO_2 to 1,000 parts CO_2 by weight.	REMARKS.
1	48	4,200	.....	.....	all.	⅓	200	
			134	500	½	⅓	179	
					1-6	⅓	130	
					none.	⅓	110	
2	47	4,500	147	425	⅓	¼	140	
3	55	4,800	124	427	all.	4-10	138	
4	56	4,800	131	500	¼	¼	220	
5	56	6,400	173	500	4-11	⅓	122	
6	75	14,500	.....	.....	all.	.....	330	Furnace full.
					"	.....	232	Furnace 15 feet down.
					"	.....	177	" 25 " "
7	60	.....	.....	.....	.....	.....	271	
8	.....	.....	.....	.....	.....	.....	128	

HIMROD FURNACE, No. 3, 3,200 cubic ft.

DATE.	Engine revolutions.	Temp. of blast.	Coke used.	Grade of iron.	CO_2 to 1,000 CO.
1875.					
May 6*	20	200	all.	.....	46
" 7	20	440	"	.....	158
" 7	20	460	"	.....	162
" 8	20	720	"	3	235
8	20	710	"	3	314
" 9	20	720	"	3	245
" 10	20	750	"	2·7	241
" 10	24	800	"	3	237
" 11	24	750	"	3	264
" 12	24	770	"	2	282
" 13	24	780	"	1	315
" 14	24	790	"	2·2	306
" 15	28	760	"	2·3	279
" 16	32	830	"	1·5	203
" 19	28	820	"	2	279
" 20	26	750	"	2·5	270
" 23	24	810	"	3	223
" 31	36	880	6-10	1·5	166
June 1	38	900	"	2·2	158
" 22	50	880	⅓	1·3	114
" 30	38	900	"	1·3	155
Aug. 11	34	900	"	3	134
" 16	38	840	"	3	165
" 17	38	810	"	3	102
" 18	40	850	"	3	114
" 19	42	850	"	3	135

* Blast put on May 6.

HIMROD FURNACE, No. 2, 8,000 cubic ft.

DATE.	Engine revolutions.	Temp. of blast.	Coke used.	Grade of iron.	CO_2 to 1,000 CO by weight.
1875.					
Dec. 9*	.....	750	3-5	.....	113
" 10	.....	880	"	.....	223
" 10	42	800	"	3	274
" 11	42	750	"	3	285
" 15	50	850	⅓	2	188
" 16	50	880	"	3	351
" 18	52	750	"	1	331
" 19	50	750	1-7	1	403
" 20	48	730	"	2·3	437
" 22	50	760	"	2·7	390
" 23	44	1,010	"	2·2	360
" 24	45	880	"	2	420
" 27	44	780	"	2·1	390
" 28	48	950	"	1	374
" 30	46	1,000	"	1·1	360
1876					
Jan. 1	42	"	"	1·1	360
" 23	42	"	¼	1·6	210
Feb. 3	46	"	2-17	3	174
May 1	47	"	1-7	1·7	170
" 2	51	"	"	2·1	218
" 3	52	"	"	2	175
" 4	52	"	"	2·2	296
" 6	52	"	"	3	148
" 7	52	"	"	3	220
" 8	42	1,020	"	3	271
" 9	45	"	"	3	206
" 11	50	"	⅓	3	306
" 15	60	1,000	1-7	3	250
" 17	52	"	⅓	3	276
June 2	55	"	"	3	331

* Blast put on Dec. 9.

The conclusions arrived at as to what influences the production of CO_2 are as follows :

1st. Kind of fuel. Bituminous coal not permitting the formation of as much CO_2 as coke.

2d. Kind of ores. Rolling mill cinder being much less favorable to formation of CO_2 than hematite ores, probably magnetites less than hematites, but more than cinder.

3d. Length of time of contact of gases with ore. Small furnaces and too rapid driving, both wasting fuel by not allowing enough time for conversion of CO into CO_2.

4th. The temperature of blast. The hotter the greater the quantity of CO_2.

5th. Regularity of passage of stack through the furnace. The hanging and dropping of the stack, however slight, seems to pack it more solidly in the hearth, increasing the resistance to the blast, and decreasing the quantity of CO_2.

These are the most common causes noticed as influencing the production of CO_2, unless we except the one that might be considered the greatest of all, the one that has spoiled so many tons of iron, and the amiability of so many furnacemen, the one most dreaded, the great unknown.

It would seem a self-evident proposition, that the better the contact of the gases with the ore, and the less with the fuel the greater would be the amount of CO_2 produced. To prolong the contact of gas with the ore, furnaces are enlarged with advantage; to better the contact of gas and ore, pains are taken to charge the stock in such manner as will best promote it. Still, with furnaces of most approved construction, and most skillful manipulation, the gases leave the furnace so rich in CO, that not half the heating power of the fuel is obtained, and the highest blast furnace authority in the world has given it as his opinion that the limit of economy of fuel under conditions existing in manufacture of pig iron in the Cleveland District, England, has been reached when the CO^2 is about 70 parts by weight to 100 CO, and the temperature of the gas is reduced to about 300° C. The same authority has also proved by experiment that CO can be entirely converted into CO_2 by passing it through sufficient quantity of ore at proper temperature, while the reducing power of the gas does not cease entirely until a lower temperature is reached. It would seem possible then, that if the furnace gases were passed through a large body of ore, separated from the fuel, just before its exit, that the quantity of CO^2 might be raised, even above the limit assigned by Mr. BELL, 70 to 100 CO by weight. As an attempt in this direction, a furnace stack, 70×15, being repaired during the past Winter, was constructed with 3 brick walls crossing each other in the center, dividing the upper twenty-five feet into six equal compartments, each provided with separate charger and gas exit. It was proposed to charge first, a part of the compartments with ore and part with fuel, allowing the gas to escape only through the ones charged with ore, or, second, to charge each compartment with ore and fuel alternately, allowing the gas to escape through the ones being charged with ore, but not while being charged with fuel.

By charging the first method, it would give a better contact of the gas with the ore and less with the fuel than in a furnace as ordinarily charged, while passing through the compartments, but just the contrary below. The question would be whether the gain in the one case would more than equal the loss in the other. It was tried and found a failure, the gain about equalizing the loss. Whether it would be possible to construct compartments large enough and to force the gas through a sufficient body of ore, separated from the fuel, to wholly reduce the ore before it leaves the compartments, is a question this experiment did not furnish any answer to. It proved only that there was no difficulty and no good accomplished in charging this furnace in this manner.

By charging the second method the final contact of the gas with the ore would be improved with none at all with fuel, while the contact below would be the same as in a furnace ordinarily charged. The question would be then is it possible to force the gas through a large enough body of ore separated from the fuel to increase to any extent the production of CO_2 and preserve a good distribution of stock in the lower part of the furnace. With this method of charging it would be necessary to provide the gas exits with suitable valves. This furnace was not provided with these, as it was not thought advisable to put them in until the first experiment had been tried. To find out whether any good would probably result the furnace was charged two days, each compartment alike, and on two different days, three of the gas exits being closed, ore and flux were charged in the compartments with open gas exits and the fuel in the others. The following gas analysis shows the result :

Charging all alike with 1-3 coke.....							381 CO_2	to 1,000 CO by weight.
With six feet of ore and flux in ore compartments..							567 CO_2	to 1,000 CO "
" four "	"	"	"	"	"	1-7 coke	400 CO_2	to 1,000 CO "
" six "	"	"	"	"	"	"	470 "	" " "
" eight "	"	"	"	"	"	"	530 "	" " "

The experiments could be carried no further, our heavy compact ores making so much smaller bulk than the fuel that the ore compartments would not be full. The results indicated so marked an improvement in quantity of CO_2 that valves for the gas exits were ordered, but before they were made the cross walls fell in.

This is the history of an experiment and its failure—failure to prove anything very definitely except that we did not build good cross walls. The Ferric furnace has shown that compartments can be constructed that will stand, so that the falling in of these walls does not afford any evidence against this plan of construction. The evidence given by this experiment is in favor of a belief that the second method of charging a furnace of this construction will increase the quantity of CO_2 when it is less than 50 parts to 100 CO by weight, with no evidence for or against when the amount produced is over 60 parts to 100 CO.

This plan of construction would be applicable to furnaces of any size using any kind of fuel or ore. The expense of the cross walls is very little, and the set of small chargers cost less than one large one. By building good cross walls, placing cast iron girders on top of them, resting the ends on the lining so that in case the walls give way the chargers would still be supported, the experiment can be made for a few hundred dollars expense and no risk. For, in case the walls fall in, the furnace can be run with the usual way of charging, as this one is now. The brick in the walls will not make very good iron nor not much better slag, but melting them does not seriously interfere with the working of the furnace.

* A paper read before the American Institute of Mining Engineers, at the Philadelphia Meeting, June, 1876.

PROJECT FOR THE ERECTION OF BLAST FURNACES IN NEW JERSEY.

By William Kent, M.E.

INTRODUCTION.

THE experience of the iron trade during the last three years has plainly shown that in the future the strictest economy of production will be necessary to the success of an iron-works. Many furnaces now in existence will have to be permanently blown out, because they cannot compete, in cost of production, with others possessing greater advantages, and will be replaced, as trade revives, with new furnaces, either in the same or in better locations, and all the aid which chemical and engineering science, as well as the best of practice, can furnish will be required, both in their design and in their management.

Economy of production will depend upon three principal points—1. Location ; 2. Design ; 3. Management.

The project herein treated of will include the location and design of an iron-works comprising two blast furnaces, with their necessary equipment of boilers, ovens, engines, elevators, and other appurtenances.

PART I.—LOCATION.

The principal seat of the iron manufacture of the United States is now in the Lehigh Valley in Pennsylvania. The furnaces in that place have the advantages of being near to a supply of coal and flux, and to ores of poor or medium quality. Nearly all of them, however, depend, for a large part of their supply, upon the magnetic ore beds of New Jersey.

As the hematite mines of Eastern Pennsylvania are being worked out, and as the magnetic ore mines of New Jersey show an apparently inexhaustible supply, it is probable that the Pennsylvania furnaces will, in the future, take a still larger proportion of their ores from New Jersey.

The amount of coal necessary to produce a ton of pig iron being less than the amount of ore, it will, generally, be more profitable to transport the coal to the ore than the ore to the coal ; hence, in this case, Northern New Jersey would appear to be a preferable location to the Lehigh Valley for works designed to produce pig iron alone. This fact has already been recognized by prominent manufacturers who have built furnaces in New Jersey, at Stanhope, Port Oram, Ringwood, Franklin, and Secaucus.

The site chosen by the writer has the advantage of being near a large number of mines, producing ore of very different qualities, so that any desired mixture may be made. Among these mines are some which contain ore practically free from phosphorus. Limestone of excellent quality may be obtained within a few miles of the works. Rail and water transportation are both afforded, the latter giving a means of procuring the Hudson River or Staten Island ores, as well as those which are sometimes imported from Spain and Algiers. Coal may be brought to the furnaces by either of the routes of transportation, and in case of a strike at the mines, it may be obtained at but little extra expense from any of the great storage docks in the vicinity of New York. In case it should ever prove profitable to use bituminous coal as fuel, as was tried at the Alburtis furnaces in 1875, it may be obtained by water without transshipment.

With reference to proximity to market, the proposed furnaces will have an advantage over every furnace, with one exception, in the State.

Real estate is very cheap at the proposed location, and any amount of worthless land may be had for a dumping ground for slag.

Red brick of good quality may be obtained within a short distance of the place, which may be a slight advantage in first cost of construction.

ORES.

With reference to the ores which may be obtained near the proposed site, much information is given in the "Geology of the State of New Jersey," by Prof. GEO. H. COOK, and in the "Annual Geological Reports of the State," by the same author.

In 1875 a new impulse was given to the iron interest of this State, by the discovery of new mines (or rather the re-discovery of old ones), which contain ores so free from phosphorus as to be suitable for the manufacture of Bessemer steel.

The Geological Report for 1875 gives the analysis of an ore from an opening near Ringwood, which contains only ·058 per cent. of phosphorus, and no sulphur, and mentions the fact that several other mines are now furnishing ore of like purity. An analysis made in 1875, by Mr. J. B. BRITTON, of Philadelphia, of a magnetite from Green Pond, shows only ·053 per cent. of phosphorus, in an ore containing 62·17 per cent. of metallic iron. It is said to be found in great abundance. It is eminently suitable for making Bessemer steel, and can be put in the market very cheaply, large masses of it being above the water-level. A contract is said to have been made to supply the Bessemer Steel Works at Harrisburg, with 50,000 tons of this ore per year.

ANALYSES OF ORES.

The following are the analyses of a few of the ores which may be used at the proposed furnaces, and in the calculations of the design it will be assumed that some of these are employed :

RINGWOOD ORES.

	Cannon No. 1	Cannon No. 3	Cannon No. 4	St. George	Miller	Old Hope	New Hope	Hewitt
Fe_2O_3	65·95	76.08	90·47	94·66	84·56	94·06	97·29	69·64
MnO	.....	.....	.....	·20	·25	·25	·35	·15
PO_5	5·56	6·59	trace	2·50	4·74	·45	·47	·19
S	....	....	....	....	....	....	trace	4·54
TiO_2	·80	·70	2·72	·65	·50	·30	·52	..
CaO	6·83	7·77	.....	2 58	5·04	1·57	·62	....
MgO	·07	·14	·72	·21	trace	·22	trace	trace
Al_2O_3	5·09	1·94	1·91	·39	3·00	2·59	·52	9·17
Insoluble	18·10	7·00	5·80	2·00	4·60	3·00	2·60	17·30
	102·40	100·22	101·62	103·19	102·69	102·44	102·37	100·99

The above are taken from the Geological Report for 1873. The excess above 100 in the analyses is said to be due to the iron being weighed as sesquioxide, while in the iron it is part protoxide (magnetic).

GREEN POND ORE.

The following analysis of Green Pond ore, was made in 1875, by J. B. BRITTON. The sulphur was contained with the iron as pyrites. With the undetermined matter there was some soluble silica:

Pure metallic iron	62·17
Oxygen with the iron	22·78
Moisture	·32
Insoluble silicious matter (white)	9·36
Sulphur	2 78
Phosphoric acid P = ·053, O = ·068	0·121
Alumina	1·02
Lime	·68
Magnesia	·36
Oxide of manganese	·06
Undetermined matter and loss	·349
	100·000

WANAQUE ORE.

The analysis of Wanaque ore from the Iron Hill Mine, is taken from the "Geology of New Jersey, 1868." This mine has not been worked for some years.

Sulphur	·9
Alumina	1·0
Magnesia	10·0
Magnetic iron ore	64·6
Silica and insoluble matter	18·8
Phosphorus	none
Alkalies	·6
Water	3 2
	99·1

STATEN ISLAND ORE.

The analysis of brown hematite from Staten Island, was made in 1868, by S. SÖBERG, Manager of the Ringwood Furnace.

Sulphur	trace
Phosphoric Acid P = ·053, O = ·068	·13
Alumina	2·80
Silica	12·80
Sesquioxide of iron	76·48
Manganese	none
Water and organic matter	8·60
	100·81

A number of other ores might be given, including the well-known magnetites of the Dover region, but the above are sufficient for our purpose.

LIMESTONE.

The following are the analyses of some limestones, which might be used at the proposed works. They are taken from the "Geology of New Jersey, 1868:"

	I.	II.	III.	IV.
Lime	29·6	30·41	29·68	51·80
Magnesia	20·3	19·29	20·07	1·37
Carbonic acid	45·5	42·60	45·51	42·23
Oxide of iron and alumina	1·8	0·80	3·50	·15
Silicic acid and quartz	2·7	4·80	·50	1·70
Water	....	0·90	.....	1·80
	99·9	98·80	99·26	99·05

I. is a fine grained bluish limestone, from the quarry of DANIEL CISCO, near Macopin, Passaic County.

II. is from Turkey Mountain, near Montville. It is extensively worked by the Boonton Iron Company for use in their furnaces. It is a true dolomite, white and crystalline.

III. is a white, crystalline dolomite from near the New Jersey Zinc Company's mine, at Sterling Hill, near Ogdensburg.

IV. is a white, crystalline limestone from G. W. RUDE's quarry, near Hardystonville.

I. and III. have been used at the Ringwood Furnaces, and, as might be expected from the analyses, with excellent effect.

III. and IV. are from a range of limestone rock which extends for many miles through the northern part of the State.

PART II.—DESIGN.

The designer of a blast furnace usually pays more attention to practice than to theory, and his designs therefore are generally copied from existing furnaces which have proved successful, instead of being developed anew from a study of the sciences which are related to the smelter's art. Alterations and improvements are made from time to time, suggested either by an observed defect in some existing details, or by a mere desire for experiment, but few if any changes have been made on account of the apparent leadings of a theory. The practice has always preceded the theory. The theory of the hot blast still embodies disputed questions, although the hot blast itself has been used for about half a century. The chemical and physical phenomena of the blast furnace have been discussed on correct scientific principles only during the last decade.

In making the design for the proposed furnaces, no attempt will be made at originality in construction, as it is safer to follow good practice than to trust to deductions from a theory which is as yet but imperfectly developed. Recognizing fully the vast benefit which is likely to be derived from a thorough working out of the principles so ably treated of in the last few years by SCHINZ, BELL, and GRUNER, we must admit that while these are of great value to enlighten us in regard to the working of any particular furnace now in blast, they do not yet teach us how to improve the shape of that furnace, nor to design the shape of a furnace which is to be used under different conditions. We are therefore obliged to follow the best practice, making judicious selections where we find differences of detail.

It is in this way that the design of the proposed furnaces has been made. In connection, however, with a description of the various parts of the design, an attempt will be made to give reasons for the details and dimensions selected, based upon calculations derived from the analyses of the materials to be used, and upon the principles of combustion which are accepted in all engineering science.

The general design is a selection of what appear to be the best parts of the anthracite furnaces which have been erected in Eastern Pennsylvania, New York, and New Jersey, within the last five years, and such a combination of these parts, that the resulting plant shall be similar in the main features to all of these furnaces, but not entirely like any one of them.

The furnaces built since the year 1870, it is well known, show a marked contrast to those built before that date. The size has been greatly increased, and the square stone stack has been replaced by the iron-cased stack supported on pillars. Boilers and ovens have been placed on the ground instead of near the top of the furnace, and the latter especially have been enormously increased in size. Engines have been improved and simplified, and in general the whole appearance of the works have been changed. That these changes have all been for the better there is no doubt. Some of them may have been carried to extremes in one direction or other, but there is a general agreement in such a large number, that we cannot fail to be safe in adopting them, keeping of course inside of the extreme limits.

TO BE CONTINUED.

THE SULPHUR MINES OF ITALY.

AMONG the recently-issued English Parliamentary Papers is a report, by Mr. COLNAGHI, Her Majesty's Consul at Florence, on the Sulphur Mines of the Province of Forli, from which we condense the following information, as it can hardly fail to be of interest to a large circle of our readers.

The sulphur deposits of the Romagna, which are of miocene lacustrian formation, are situated amid the sub-Apennine hills, and the mines now being worked in the province of Forli are spread over a superficial area of 260 square kilometres. The outcrop of the rocks of sulphate of lime (gypsum), and those of carbonate of lime resting on gray clays or marls, denote the presence of the sulphur, which is covered with 10 or 12 strata of clays, intercalated with gypsum under various aspects, wherever the water-courses have not in part destroyed them. The total thickness of these strata to which the sulphur often conforms, is from 35 to 70 meters. The direction of the sulphur beds is generally towards the north-west, oscillating between 22° and 58° N. W., except at Perticara-Marazzana, where the strata lie E. N. E. (70° N.E.) Here the mineral forms a lode, while at Predappio it is a mixture with limestone, gypsum, and marl.

From a document existing in the archives of Ravenna, in which a parish of San Pietro, in Sulferina, in the district of Cesena, is mentioned, the existence of this mineral would seem to have been known in the eleventh century. In 1344, OSTASIO DA POLENTA bought certain estates in the neighborhood of Polenta, his right to dig for sulphur being expressly mentioned. The mineral is noticed in the poems of DARIO TIBURTI in the fifteenth, and of FOLENZO in the sixteenth centuries; and GEORGE BAUER, or AGRICOLA, in his work on Mineralogy, published in 1546, speaks twice of the sulphur of Cesena, and praises its quality.

A law of the Pontifical Government of 1510 declared all mines to be State

property, and Paul III., acting under it, annulled by brief of 1535 the privilege granted by his predecessor, Clement VII., to the Valoris of excavating sulphur in the territory of Cesena. He transferred the privilege to the inhabitants of that city and district, giving them the right of preparing the mineral, and of freely selling the produce, save to infidels. This gave rise to the idea that the owners of land were entitled to work any mines that might exist under their property, an interpretation refuted by the Pontifical letters of Gregory XIII., in 1580, by which the rights and dues belonging to the State were recalled to vigor, and their imprescriptibility established. The brief of Paul III., of 1535, was still in force when the province of Forli was annexed to the kingdom of Italy, and has never been formally abolished; In 1865 a royal decree was published regulating the position of owners or workers of mines in the province with reference to the Government, embodying the principles of the Sardinian law on mines of 1859, which are inserted in each concession granted.

From 1865 to 1870 the industry of which Consul COLNAGHI treats, does not appear to have progressed very favorably, and even the Società delle Miniere Zolfuree di Romanga, of which from 1855 to 1864 the profits had varied from 5 to 21 per cent., the average for the 10 years being 12·60 per cent. was not able in 1872 to pay the modest dividend of 3 per cent. without trenching upon its sinking fund. The company with its fine mines has, however, always maintained its production. A great drawback to the prosperity of many of the mines was the absence of a complete network of good roads. In 1865 three of the mines only were easy of access for carts; but since then considerable advance has taken place, and branch roads, where required have been made at the expense of the companies interested. In 1872 the principal mines belonging to the Società delle Miniere Zolfuree Cesenate, were purchased by an English company (Limited), with a nominal capital of £350,000 sterling, and a new era of activity commenced for the sulphur region of the district in question.

The chain of the Apennines of the province of Forli, Pesaro, and Urbino offers a large field for the growth of this industry. The total quantity of refined sulphur produced in 1874 amounted to about 24,700 tons. The profit per ton of refined sulphur is said to be from £2 to £2 10s. The sulphur of Romagna is worth from 15 to 20 per cent. more than that of Sicily, on account of its intrinsic good quality and the degree of purity to which the refineries have brought it. The largest part of the production is used for sulphuring vines, and is readily consumed in Italy. In 1874 about 2,134 tons of Romagna sulphur was exported from the district of Ancona to France, Turkey, and Austria, and a certain quantity appears also to have been sent overland to the ports of Leghorn and Genoa for shipment. Consul COLNAGHI, however, believes that there is very little, if any, exportation to England. Foreign trade is as yet little acquainted with the value of the Romagna sulphur, the production of which has not long been brought to its present development. The facility of shipment of Sicilian sulphur naturally attracts trade to the South; but as soon as the position of the Romagna mines is bettered in that respect, there is but little doubt that the sulphur trade in connection with them will be enormously expanded.

We cannot follow Consul COLNAGHI through all the particulars which he gives respecting various mines, but we will devote a brief space to his remarks on the Cesena Sulphur Company, which, under the able management of Mr. F. KOSSUTH, C. E., managing director, appears to be advancing steadily on the path of prosperity, On account of the large works for developing the mines many hands are required, and about 1,000 men, exclusive of carters, are employed.

The men are maintained in excellent discipline by the combined means of regular payment, and kind, but firm, treatment. The only foreigners at the mines are the managing director and one English mining engineer, all the miners being Italians, and most of them natives of the district. The men work in gangs, three to 24 hours. Each miner is required to bore three holes in 6 hours, which being done, the whole gang fire their mines together—an operation attended with great difficulty, from the dense sulphur smoke developed, which renders respiration barely possible. The mineral is cleared away by the gangs of carriers and wheelers, and carried over tramways which extend to the headings. Each miner is paid the equivalent of about 1s. 3d. per tramload of 700 kilogrammes (1 kilogramme equal to 2·2046 lb. avoirdupois), and his earnings are estimated at one place to be from about 3s. to 3s 9d. per diem; to make the latter sum, however, the gangs have to unite and work extra time. When stone only is found and no mineral, an allowance is made, to enable the men to live while working. The firemen are paid per ton on the production of the kilns, and their average earnings are about 2s. 6d. per diem, those of the carters being 1s. 8d. to 2s. 1d. per diem. The men live chiefly on bread, cheese, and vegetables, eating meat on Sundays. They spend much on dress, and on holidays look like well-to-do people; they drink wine freely, but no spirits. They are more persevering at work than English workmen in cases of urgency, and many of them have remained underground for 24 consecutive hours, when required. They are very obstinate in using their own tools and in working in their own way, and are accustomed to emphasize each stroke of the borer with their voice. These miners of the Romagna are quarrelsome among themselves, and ready with their knives; as a general rule they are superstitious, and are convinced that the spirits of those who have lost their lives through accidents in the mine hover about the works underground. The company have a store at the mine for the convenience of the men; but this *bettolino*, or tommy-shop, is on a better system than it was under the old management before the days of the English company. The wages are all paid in money, and the men are free to spend their earnings where they choose. A mutual relief fund has been established to assist the sick and wounded, and the widows and children of the men who may be killed. The company grants pensions according to the emergencies of each case; but levies 2 per cent. on the men's earnings for the support of the fund, as well as towards the maintenance of the doctor, infirmary, etc.

The Società delle Minere Zolfuree di Romagna was established in 1855. In 1872 this company's mines produced 58,412 tons of mineral, which yielded 7,873 tons of black sulphur. In 1871 the mineral produced was 58,108 tons, and the yield in black sulphur 8,278 tons—the difference in product between the two years being caused by a falling off in the quality of the mineral extracted. Among the company's mines those at the Marazzana and Perticara are the most extensive; the latter, indeed, is one of the most celebrated and important sulphur mines in Italy. Mineral in lenticular masses averages 15 per cent. of sulphur. In the midst of the gypsum, the lower regular stratum, 2 meters thick, averages 12 per cent. of sulphur.

Works in 1874:—Galleries, etc., 5,800 meters; facings, 240 square meters; depth, 242 meters. The interior works are conducted by a system of galleries, supported by pilasters, and they communicate internally with the Marazzana Mine. The Perticara Mine has been worked for 150 years, and, the works being deep and water present, the cost of extraction is heavy; compensation is found, however, in the excellent quality of the produce. The two mines of Marazzana and Perticara may be valued at from 30,000 to 35,000 tons of mineral per annum; the proportion of black sulphur is from 13·5 to 14 per cent., which would give about 4,000 tons of refined sulphur, taking into account the loss of 5 per cent. for refining.—*London Mining Journal.*

GOLD IN TEXAS.

TO THE EDITOR: Sir—Gold was first found in Texas in the general search for that metal which occurred in consequence of the great discoveries in California. About 1852 the ubiquitous "returned Californian" explored Sandy Creek, near Enchanted Rock, about the center of the State, and a quill full of coarse gold is credibly reported to have been taken to Austin as the result. But that finished the adventure, and, as a rule, mining, as a pursuit, has slept quietly, though several expeditions in search of copper, lead, silver, and gold are reported. These have at length produced their fruit, and now it seems probable that Texas may, before many years, have an extended mining industry to sustain her agricultural resources.

About the center of the State, and a hundred miles or so from the present Indian frontier, are the Counties of Mason and Llano. They are hilly, especially the former, which is the more western, and stand from 1,000 to 1,200 feet above the ocean level. The hills, though numerous, are not high, rarely reaching 300 or 500 feet. Through this region runs a belt of red sandstone rocks, interspersed with a little crystalline limestone, and a good deal of granite. The latter does not appear to be intrusive though areas of eruptive rock, may possibly be found in quarters which I did not explore. But the whole district has been subjected to strong metamorphic agencies, and the rock is exceedingly hard, and often a true quartzite. Ledges of pure white cryptocrystalline quartz are abundant.

Some of the strata are permeated with copper ores. Malachite and azurite as derivatives, and erubescite and tetrahedrite, with sometimes a little pyrite, are found in small seams and grains through the rock. With them occur silver and gold, the former in combination with the copper and sulphur, the latter native. Assays run as high as $800 a ton, but no means of ascertaining the average value of the ore have yet been applied. A series of assays, which are reported to have given $50, are, perhaps, near the truth, though it is more probable the average will be between $20 and $50. These ores and this region are very interesting, both in a practical and scientific point of view. Mining industry, or a manufacturing industry, is just what Texas needs as a State. Its immense agricultural resources will be doubled in value by the growth of a non-producing community near by, and its lands, which are now in the market in excessive quantity, because their vast extent overweighs her natural and artificial growth of population, will more readily find purchasers. But the question is, what prospect has the State of acquiring such an industry?

Until the ground has been explored more carefully, this will remain doubtful, but if analogy and precedent are to guide us, we may look for the gradual growth of a great and important mining field there. The Texas ores stand in complete parallelism to one class of Lake Superior ores. The rock is the same, a sandstone, while the greatest mine on Keweenaw Point, also the greatest copper mine in the world, is in a conglomerate. At Lake Superior the mineral is native copper. In Texas it is a copper sulphide, but the advantage which the former has in yielding metal by simple milling, is counter-balanced by the gold and silver found in the Texas ore. The latter enjoys, with the former, the supreme advantage that its ores, though low grade, can be concentrated at a cost of $1 to $2 per ton to a mineral of maximum richness. In fact, a moderate addition to the cost of producing copper in the Lake Superior region should suffice to extract both silver, gold, and copper, from the Texas ore.

As to the permanence of the deposits, all the evidences of the field in Texas are that the mineral has been derived from below, probably through the medium of hot water. Economically this is equivalent to a "true vein," the especial value of which in practice is that it presupposes a filling from below. For these reasons I have formed an opinion of the Texas field, which is perhaps more favorable than the work actually done on the ground will warrant. Only two mines have been opened, but they are both in the hands of men who intend to go further. We may fairly anticipate that when they shall have fully opened these deposits, they will enjoy the following advantages: 1, deposits as permanent as the conglomerate mines of Lake Superior; 2, an easily worked ore; 3, mines which will permit the extraction of very large quantities of rock. It is evident that on such a basis as this, the Texans have good reason to congratulate themselves.

JOHN A. CHURCH.

TARRYTOWN, N. Y.

JAPANESE PORCELAIN.—The beauty and finish of the porcelain exhibited in the Japanese department of the Exposition have elicited universal commendation. Most of this ware is produced at the Sato potteries, which have been in existence over a thousand years. Sato is described by a newspaper correspondent as a town on a mountain stream 12 miles from the sea and containing 8,000 inhabitants, all engaged in porcelain manufacture. No machinery is employed, and as skilled artisans receive less than 50 cents a day, the ware is produced at little cost. Nature seems to have made special provision for this manufacture at Sato. Kaolin of the finest quality in the world exists in enormous beds, readily accessible, the cobalt is dug out of the alluvium in the bluffs around the town, the purest water is furnished by the stream, within a mile of the factories may be obtained the fire-clay for the ovens, the wood for baking, and the quartz for glaze. The process of manufacture, as carried on without variation for a thousand years or more, is represented to be as follows:—"The clay is taken out of the beds and carried on the backs of men to the factories, where it is carefully and patiently manipulated till ready for the turning-wheel, which is exactly like those represented on the old Egyptian ruins. The turner sits, in true tailor fashion, on the same level as the wheel, and, with consummate skill and unwearying patience produces all shapes and sizes. When I saw them working, I was struck with the triteness and force of the old Hebrew proverb, "Like clay in the hands of the potter." From the turner the vessel is carried to the drying house, where it stands for two weeks, and then is put into ovens and subjected to a heat of from 400° to 600° Fahrenheit. Thence it is taken in this half-burned state to the turner's wheel again, who now proceeds to smooth it and make it thinner with a small piece of thin-edged steel. Then the painter decorates it with oxide of cobalt, which, as they put it on, is anything but ornamental, being black. The painter sits on the floor and holds the vessel, if small, in one hand, and paints with a small hair pencil with the other, having no support for either hand. He paints rapidly and skillfully, with no guide to form his figures but his eye. All ware is hand-painted. They know nothing of copper-plating as yet. From the painter the ware goes to the glazing-house, and then to the large oven, where it is burned in large quantities and subjected to an intense heat, whence it comes out clear white and translucent, but not so much vitrified as to have lost its earthy texture so entirely as to be brittle. After all this it is carried on the backs of men 12 to 15 miles down the winding road along the beautiful stream to the bay, where it is shipped to all parts of Japan."

ABSTRACTS OF LECTURES ON MINING.—No. XI.

By Prof. W. W. Smyth, M.A., F.R.S., Royal School of Mines, London.

(From the London "Mining Journal.")

AT the close of the last lecture we considered briefly some of the considerations which should guide us in the inquiry as to the desirability of opening old mines; and there are a few more points I should like to notice briefly on the same subject. We must consider, for example, whether the vein is likely to have been worked out to any great depth, and whether the present price of the mineral to be obtained is very different from what it was when the mine was abandoned. Beyond this there are some points connected with the practical worknig which have to be considered; for instance, where the rock was of a very soft character, the result of letting the water in, and of the considerable pressure for a long period of the rock mass at the sides of, and above the levels, is in many cases to entirely destroy the excavations. In such a case the re-opening of the shafts and levels would be necessary to such an extent that it might be fully equal in expense, and greater in risk to the men, than it would be to open a mine in fresh ground. There is another point which appears exceedingly simple, but which I mention because more than one undertaking has failed from the neglect of the precaution, that what you have to do is not merely to re-open the shafts, remove water and get to the bottom of the mine, but that then everything is to be put into condition for working, and further capital must be laid out in order to work a way to the deposits. It is necessary, therefore, to take care that when the bottom is reached there is still sufficient capital in hand to enable us to get into profitable ground.

We proceed, next, to consider what are the principles by which the miner must be guided when exploring ground of a new character, or in a new district, both as to the lodes and other repositories. And it is worth while looking at what has been said on the subject by those who have preceded us. In AGRICOLA'S book, for instance, we find certain rules laid down, and among them are a number of points to which we must listen with attention, although at first sight they would appear to be merely the result of imagination. Our best guide will be those features worked out on a system of geology and mineralogy by which, on the one hand, we learn to recognize what are the best districts in which to search for minerals, and, on the other, to recognize the minerals themselves, as also those with which they are usually associated. It was an idea of the old writers that the mere latitude of a district would be a clue as to the nature of the minerals likely to be found there, and it was thought that while gold and gems belong more especially to tropical regions, coal is associated with comparatively high northern latitudes. The more we know of geology, the less disposed shall we be to place any reliance in generalizations of this character; and, in fact, the presence of coal in Borneo, China, and India, and of gold and gems in extra-tropical countries, shows that the rule is not correct. Again, by nearly all the writers on the subject, it has been stated that in a mountainous district there is not so much probability of finding mineral deposits in the rugged precipitous central chain, but rather in the subordinate parallel chains, which usually are of a more gentle and rounded character; and this is borne out if we look to the position of the mining districts of the Alps or the Himalayas, etc. In the Austrian and Swiss Alps little of value has been met with in the central chain, but such districts as those of Innsbrück and Schwartz, known to these early writers, are situated in the secondary chain. In the Saxon District, although there is not a precipitous central chain, yet the best districts are those away from the central parts, and the same is true of Hungary, so that this general statement was founded in many cases on true observations in European localities.

Another point to be regarded, if we follow these older writers, was somewhat fanciful—that we should seek for the lodes on those hill sides which face the sun, or face a stream of water, or a large body of water. But if we look over any district which has been thoroughly explored, we shall find it difficult, I think, to give preference to any particular direction in this respect. I have already mentioned how the surface of the ground is covered with alluvial matter, so as to hide in many cases the back of the lode, and also that in some instances this back is marked by a distinct ridge. A recent notable case of this kind is that of the Vulture Lode (gold), in Vickenburg, in South America, where the back stood up 80 feet above the ground. In other cases a depression of the ground may reveal to you the position of the back of a lode, and this is the case on the Yorkshire Moors, for instance, where a small depression on the escarpments often showed the existence of a dislocation in that place; or the depression may indicate the position of a flat. Appearances of this kind may likewise be seen in the district of Cardiganshire and Montgomeryshire, and indeed this is a most inviting district to the mining student, because, in the first place, there are a great number of lodes; and, secondly, because it is a county of open hill, and there are no hindrances to traveling in the form of hedges or walls. Again, the old miners had the impression that snow would not lie on the backs of the lodes in the same way as on the country around, so that after a slight fall of snow you might observe the localities of the lodes by the absence of snow in those places. And there was some reason for this, for where you have a little channel it is obvious that the ground is there in a different condition to the walls; or, again, if just beneath the surface you have a lode containing quartz, decomposing pyrites, etc., there would be a tendency for the ground to be of a temperature, in that particular spot, different from that of the general ground at the sides. And on looking across a tract of such country from a small hill, you may see these lodes indicated in such a way as the above, or the grass may be of a different color, or there may be a little water, etc. Our forefathers used to believe that certain plants and trees had special liking for particular classes of minerals, and that they might be taken as guides to the localities of these minerals, but we cannot accept this principle.

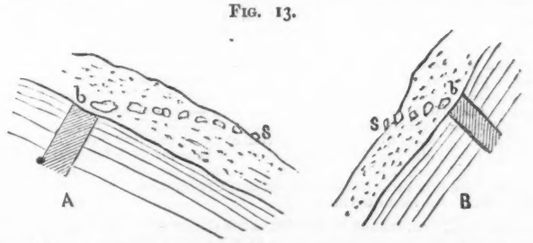
There is another point which has not been frequently appreciated—that in places you may find out the position of some classes of lodes by a tolerably acute sense of smell, the presence of pyrites and similar minerals, giving rise to sulphurous acid, and, perhaps, other gases. I have observed this in connection with lodes in the County of Wicklow, in the west of the County of Cork, and in some mines in Cornwall, and the odor is especially noticeable where the sun is shining out brightly after a tolerably heavy shower. We come next to a phenomenon which it may be said is apochryphal, but which I am bound to mention with respect, because it has been reported to me by persons in whom I can place reliance, although I know it is difficult to assign a reason for it. It is this, that on the backs of certain lodes, in particular conditions of weather, a series of corruscations of light may be seen playing, described as like a lambent flame, and it is said that in some cases these appearances have led to the discovery of lodes. I have the authority of several mining captains that they have seen this on Summer nights, but I have not had the advantage of seeing it myself, although I have often looked for it. When we recollect the well-established phenomenon of ST. ELMO'S fire playing about the masts of ships one cannot help thinking that there may be something in the appearances I have referred to. I have been informed that it was a common thing thirty or forty years ago to see these phenomena on Wheal Buller, but they have ceased since the lodes have been worked. It seems possible that the explanation may be in the decompositions and re-compositions which we know to be going on at the surface of these lodes, and especially, perhaps, in the occurrence of phosphates and arseniates.

We must not omit to take notice of a curious belief which still holds its ground in many districts—the belief in the divining rod. A paper on "Rhabdomancy" was read at the last meeting of the British Association, and one need only refer to the report of that and to the correspondence carried on recently in the *Mining Journal*, to see what varying opinions are still held concerning this matter. One is bound to say that it is extremely unfair on the part of those who argue against it to assert that all who speak in its favor are impostors. The main facts are these. About the 12th or 13th century the use of the divining-rod acquired a great reputation in Germany. After that there arose a prejudice against its use, especially on the part of pious people. In Germany the practice has now been almost entirely given up, but in England, France, Hungary, and America there are still many who believe that the rod will, in the hands of proper persons, indicate the position of metals, or minerals, or streams of water. The rod itself is a forked twig; some hold that it should be of particular kinds of wood for the discovery of particular minerals, others consider that hazel may be used in all cases; it is stated, too, that it should be cut at a certain time of the year, a thing we can readily understand, seeing that it is requisite for the rod to have a certain amount of flexibility. Dr. PRYCE was a strong believer in its efficacy, and Mr. COOKWORTHY, of Plymouth (who, with Mr. WEDGWOOD, was at the foundation of the British pottery manufacture), was a great adept in its use; and about 1854 Mr. CHEVREUL wrote a treatise on the subject, going carefully into the different modes of explaining its action. I should say it is allowed that it does not answer in all hands; that a clumsy rough hand is sure to fail, while a delicate handling by a nervous kind of person is likely to succeed. Very few cases can be pointed out assuring the value of the indications of the rod, but still I have seen lodes in actual work which the captains told me were discovered by no other means than the rod. Certainly there is a curious mechanical problem connected with the rod when properly held, for if once it commences to go down you are utterly powerless to prevent it.

Let us suppose, now, that we have a new district, or country, to examine for mineral lodes. We take the banks of a river, and examine the rocks carefully for any appearance of a lode, and then we come to the examination of the bed of the river. Noting carefully the various pebbles which the river has brought down, we look for what the miners call shode-stone, or specimens of minerals or of rocks likely to be associated in lodes with useful minerals. If the stones are large and angular we may fairly conclude that they have not traveled far, and, therefore, may assume that the locality from which they were derived is near; on the other hand, if they are rounded and smooth, we infer that they may have been carried a great distance. Where the minerals—as gold—run into minute grains and leaflets, they have been transported from an enormous distance. In any case, however, we follow these shode-stones up the river till we find them to cease, and then we imagine we are near the point of their orgin; as we trace them up the stream we shall most probably find them to grow larger and more angular. Knowing the general direction of the lodes in the country, or ascertaining the probable direction by the observation of small strings and veins, we dig our trenches or sink our costeaning pits at right angles to this direction, and try to come on the lode. If not successful, it may be that the veins run in a totally different direction to that believed, and, therefore, our second set of operations must be carried on in a direction at right angles to the first. In some parts of the North of England, in the Moorland district, the miners have a method, called "hushing," of saving themselves the trouble and expense of trenching or costeaning, although this is not quite legitimate, inasmuch as it is very injurious to the land. In former times the practice was more prevalent than at present, for we find traces of it in Wales and other parts where it would not be allowed now.

The method consists in selecting a little hollow at some distance from the stream, and damming it up so as to collect the rain or spring water and form a kind of pond. When sufficient water is collected it is allowed to rush suddenly down toward the stream, tearing up the soil as it goes. This is repeated, if necessary, till the trench is deep enough to expose the rock beneath, when search can be made for the lode. This process of washing not only serves the purpose of clearing the rock for examination, but in some cases very large and profitable masses of ore, galena, etc., are obtained by the process. The importance of shoding was judiciously remarked upon by PRYCE, who laments that in his day the science of shoding was almost lost. But within the last 25 years a great impetus has been given to the exploration and examination of different districts, so that in many of them you may find among the explorers or prospectors men whose opinions on these points are thoroughly matured. There are one or two points in connection with these shode-stones to be noticed. It often occurs that in ploughing a field the plough turns up a piece of mineral or lodestone. The question occurs where has it come from? If it is extremely rounded, and occurs in what geologists would call the foreign drift—which in some of the northern countries may reach a thickness of 120 to 130 feet—it would be perfectly useless to search for the locality whence the minerals were derived. It is only when the drift is of a very local character that we should be able to follow these shode-stones to their origin.

FIG. 13.



PRYCE says—"If the shode is found on vegetable soil the lode is not at hand, but if it lies deep, massive, and angular then the lode is not far off.

Suppose we find a shode-stone on the slope of a hill-side, as at *s*, Fig. 13

either on or close to the surface; we may assume that it has been broken away for some rock which crops to surface at a point higher up the hill. They break off for some point, *b*, and as they make their way down the hill they approach nearer and nearer to the surface, till at last they come to the light at *s*. A series of shafts sunk at points above *s* would show these stones deeper and deeper till the point of their origin is found at *b*. Sometimes you may see the whole process before your eyes in a cutting by a stream, or, as in a case I remember near the town of Falmouth, in a road cutting, and here you can trace out the course of these stones from the back of the lode approaching gradually to the surface. In such a case there are two things to be observed—first, the dip of the hill; and, secondly, the thickness of the alluvial cover. Of course, the thicker the cover the greater will be the distance between the appearance of the stones at the surface and the back of the lode; or, again, if the thickness of the cover be the same, the steeper the hill the nearer may we expect the surface stones to lie to the back of the lode (Fig. 13, A, B). If we have an angle of 20° to 30°, and the thickness of alluvial 5 to 6 feet, then we may have to travel a distance of 9 or 10 fathoms from the surface stones in a horizontal direct on in order to come on the lode. Having approximated to the position of the back by the small shafts mentioned above, then we may drive at right angles to the probable direction of the lode, so as to endeavor to intersect it. All the operations we have been considering are to be regarded as necessary preliminaries before being able to examine the back of the lode, in order to form some idea as to its value.

INTERNATIONAL EXHIBITION OF 1876.

Special Report of the Engineering and Mining Journal.

ADMISSIONS FOR THE WEEK ENDING SEPTEMBER 5, 1876.

Date.		Paying Visitors.	Press, Complimentary, and Exhibitors.	Total Visitors.
Previously reported.....	.....	2,535,659	968,240	3,503,899
August 30	97th Day..	43,473	10,130	53,603
" 31	98th " ..	45,790	10,342	56,132
Sept. 1.....	99th " ..	34 737	10,379	45.116
" 2.....	100th " ..	59,595	10,728	70,323
" 4.....	101st " ..	37,628	11,605	49.233
" 5.....	102d " ..	53,955	10,950	64,905
Totals.....		2,810,837	1,032,374	3,843,211

NOTES.

THE ANDOVER (N. J.) IRON COMPANY reduces the wages of its employees this month from nine shillings to one dollar per day.—*Iron Era*, Sept. 2, 1876.

THE BETHLEHEM IRON COMPANY, it is reported, has cut down the wages of its employees at Hibernia, N. J., to eighty cents per day.—*Iron Era*, Sept. 2, 1876.

NEW NICKEL DEPOSITS IN SPAIN.—There exists in the province of Malaga, Spain, a large deposit of nickel, of which the exploitation has lately been begun. Analysis shows for 100 parts of ore, nickel, 8.96; cobalt, none.

LAKE AINSLIE (C. B.) OIL WELLS.—These oil wells are reported as promising a large yield. In consequence Western oil producers will probably lose their customers in the Lower Provinces, the late rise of three or four cents per gallon being protested against by the dealers.

CRANE IRON COMPANY.—It is rumored that this company is about to blow out its three remaining furnaces in the Lehigh Valley. They own six furnaces, three of which were blown out some time since. Of late they have worked their mines in this section but little.—*Iron Era*, Sept. 2, 1876.

A LARGE STEEL-WIRE CABLE has lately been placed in the shaft of the Imperial Consolidated hoisting-works. Its length is 6,090 feet, its weight 24,228 pounds, and its cost $8,500. The freight from San Francisco amounted to $490.98. The cable was manufactured by HALLIDIE & Co., in San Francisco, and is the first one of the kind ever made on the coast.

COAL MINES CAVING IN.—The people in the vicinity of Centralia, Pa., are greatly excited over the recent caving in of some ground in the lower part of the town, it being completely honey-combed. The surface continues to crack and crumble and show signs of weakness generally. The ground above GORRELL & Co's mines is slowly settling down, and the miners have all refused to stay in the mines.

BOONTON (N. J.) IRON WORKS.—The recent stoppage of these works has caused considerable depression in business, and extreme want among the working men of that place. Some of the stores are already closed, and others are about to suspend. A large meeting of the employees of the works was held on the 26th ult., and committees were appointed to petition the owners of the mills to resume work, and to take measures to relieve the destitute families of the place.—*Iron Era*, Sept. 2, 1876.

ON THE STOPPING-UP OF THE REGENERATORS IN SIEMEN'S FURNACES.—L. BORBELY, *in Zeitschrift des Berg- und Hüttenmännischen Vereines für Spiermark und Kärnten*. The author thinks this is caused by the natrinm chloride, which is usually present in minute quantities in the sand bottoms of the reheating furnaces, and the water used to solidify the slag bottoms of the puddling furnaces; the sodium chloride forming, with the iron on the hearth, iron chlorides, which are carried by the escaping gases into the reheating chambers, where they are decomposed by the aqueous vapor (always present) to ferric oxide, which is deposited as brick red powder, and hydrochloric acid. The ammonia, which is volatilized from the fuel, comes in contact with the acid when the valves are reversed, and forms ammonium chloride, which is decomposed in the presence of the iron on the hearth. The author thinks that, in this manner, small quantities of sodium chloride exert considerable influence. He thinks that by conducting the gases from the generators into towers filled with coke, and thus preventing the ammonia from coming in contact with the hydrochloric acid, the blocking up of the brick-work in the regenerators by the ferric chloride will be prevented.—*American Chemist*.

REPORT OF BRITISH COMMISSION ON SPONTANEOUS COMBUSTION OF COAL.—The Royal Commission on the spontaneous combustion of coal have presented their report, in which they summarise as follows the conclusions at which they have arrived: "That certain descriptions of coal are intrinsically dangerous for shipment on long voyages. That the breakage of coal in its transport from the pit to the ship's hold, the shipment of pyritic coal in a wet condition, and especially ventilation through the body of coal cargoes, conduce to spontaneous combustion even though the coal may not be unfit for conveyance on long voyages. That spontaneous combustion in coal cargoes would be less frequent if regard were had by shipowners and underwriters to the facts. That when coal is being carried on long voyages the temperature in the various portions of the cargo should be tested periodically by thermometer, and registered in the log. That with a view to guard against explosion, free and continuous egress to the open air, independently of the hatchway, should be provided for the explosive gases by means of a system of surface ventilation, which would be effective in all circumstances of weather. That, in order to make known the descriptions of coal liable to combustion, the inspector of mines should be instructed to hold inquiry into all cases of spontaneous combustion occurring in cargoes of coal taken from their respective districts, exporters being required always to record on their specifications the denomination of the coals forming the cargo. That no additional legislation with reference to the conveyance of coal by sea is required unless for the purpose of giving effect to our proposals with regard to the inquiries by inspectors of mines, and to the fuller specification of coal entered outward at Her Majesty's customs."

COLORADO MINES.

Special Correspondence of the Engineering and Mining Journal.

TO THE EDITOR: Sir—You will, I suppose, be looking out for some news from the Centennial State. We were so elated at the admission of our bright young Territory to the honors of statehood, that between that event and the celebration of the Centennial Fourth, we had hardly room for a thought of work all July. But once more the boys have settled down to work. Ground sluicing is good, and will go over 20,000 this season.

The works of the *Malta Smelting Works*, superintended by EMILE LOESCHER, Esq., are a complete success.

The Printer Boy Mine is idle, but there are hopes that it will open up with vigor this Fall, when the agent, the Hon. J. M. PAUL, returns from the Centennial.

The Oro Ditch and Fluming Company, under the efficient management of W. H. JAMES, ESQ., is doing good work.

The Little Willie Lode, owned by LEE & DOYLE, and at present worked by the Smelting Company, yields 144 oz. of silver per ton.

The Hidden Treasure, 25 to 90 oz. silver per ton.

The Dyer Lode, owned by TABOR & HENDERSON, is now taking out ore, running 358 oz. silver per ton.

The Mike Lode, owned by LYNCH & HAYES, averages 20 to 60 oz. in silver per ton, and 40 per cent. lead, and has a vein 26 feet between walls.

The head of the *Arkansas* is being prospected by about 100 men; present discoveries average from 10 to 100 oz. silver.

The Homestake Mine, owned by Col. JAMES ARCHER, of St. Louis, is being developed.

The La Plata, with six men, is turning out from one to two hundred tons per month, averaging 30 oz. in silver, and ¾ oz. in gold.

More news next time. M. H.

ORO CITY, Aug. 20, 1876.

MINING NOTES FROM COLORADO, GEORGIA, MICHIGAN, UTAH AND MEXICO.

COLORADO.—*California Gulch Lead Mine.*—The openings on this mine already made shows the most extensive deposit of almost pure carbonate of lead ever discovered in this country. The nature of the lode is of the character of coal and iron deposits of flat contact form, with a dip into the mountain of about 15°. The property has been proved for 4,000 feet in some twelve different places by means of levels driven at nearly right angle to the strike and dip of the lode. It was supposed the lode was from twelve to fifteen feet in thickness, but one level driven across the lode shows a thickness of 40 feet, the head being driven through solid mineral of great purity the entire distance. Several hundred tons have been smelted, the value for hard ore (about one-fourth of the mine) 50 to 55 per cent. lead, 12 to 15 ounces silver, while the soft ore (three-fourths of the mineral) runs 60 to 70 per cent. lead, and about the same amount silver. The capacity of the mine is at present 100 tons per day, and it is the intention of the owners to open the property to a capacity double this amount. The St. Louis Smelting and Refining Company will be able to find transportation for 50 tons per day. The Malta Works, three miles from the mine, will afford a market for about 10 tons per day, and it is the intention of the owners to erect works of their own, with a view of meeting the entire product of the mine.

The Dom Pedro Silver Mine, one of this year's discoveries, is located in Independence Gulch, a little distance below timber-line. The vein runs up the side of the hill, cropping out for hundreds of feet and showing galena and gray copper in great abundance. The owners have commenced an adit at the base of the mountain, and propose to develop the mine thoroughly this Fall and Winter, so that it can produce heavily next year. Its location is very favorable for profitable work, and as the ore contains a large per cent. of lead, it will find a ready market in Montezuma and Hall Valley.

The Register Silver Lode at Central is reported to be doing remarkably well. This was to be expected, for it is one of the finest veins in the county, and in former times had a good standing among the great veins of that camp. The shaft is now down a little over 100 feet, and carries a vein of pay three to four feet in width. Drifting has commenced, and the production is ranging from fifteen to twenty tons per day. The Jessie (an extension) is about to start up. It has a shaft forty feet deep, and carries as fine a vein of iron and copper. Between these two workings (a distance of 1,000 feet) the vein has been explored to some extent and found valuable also.—*The Mining Review*, August 26, 1876.

The Saco Silver Mine—This mine is located on Leavenworth Mountain. The Crosscut Tunnel has been driven to cut the lode at a depth of over 200 feet from the surface. The level will be driven west, and winzes raised to connect the tunnel with the upper workings. This will afford perfect drainage to the whole mine, and open an amount of ground which will enable the owner to take out an enormous amount of ore within the next year. This mine has produced over $200,000 in the past, and with the advantage of being able to work through this tunnel. The tunnel is provided with a track of "T" rail, and there is enough rail on hand at the mine to put down 100 feet more, which will be laid as fast as the drift progresses.

The Norman Silver Lode and Tunnel is situated about one mile up Beaver Creek, near Alvarado, in Clear Creek County. The lode is a large fissure vein, carrying vein matter two to four feet wide, with some sulphurets of silver and galena showing in the quartz, assays of which run from 40 oz. to 1,000 oz. silver per ton. A shaft has been sunk on the vein to a depth of forty feet, and an adit has been run on the lode about 150 feet. When the shaft is connected with the tunnel, work can be continued along the crevice for a long distance without further ventilation. A cabin has been erected at the mouth of the tunnel large enough to accommodate twelve men.

Pickwick Silver Mine.—This mine is on Saxon Mountain, in Clear Creek County, and is now looking well. In one shaft, 50 feet deep, they have a solid mineral streak of one and a half inches, which mill runs first-class 1,672 ounces silver per ton, second-class 480 oz. In another shaft, 32 feet deep, they have from one and a half to three inches of the same high grade ore. They are running a tunnel on the vein, now in 145 feet, on the west end and have some mineral, although the best deposit is believed to be east. Work is steadily progressing.—*Colorado Miner*, September 2.

The Bear Creek Gold and Silver Mines lie within 18 miles of Denver, and consist of a number of well-defined mineral-bearing veins, some of them undergoing development. The Centennial claim is now at a depth of twenty-five feet, showing seven feet of solid quartz, similar to that found in the mines around Central City. The

walls are clearly defined and smooth, and the appearance, point to a true fissure vein. A number of assays have been obtained, showing gold and silver from $5 to $150 to the ton, gold predominating. The quartz is also an excellent flux, rendering its reduction much cheaper. The direction of the lode is easterly and westerly, and can be traced upon the surface a distance of several thousand feet, so that several locations have been made on the same vein. Some forty or fifty tons of quartz have been taken from the shaft and it looks exceedingly well. A cross lode lying in the same vicinity has also been located with strong prospects of wealth in its composition. Appearances indicate that at no great depth a grade of ore will be struck that will be far richer, as traces of tellurium are reported, and also some quite fine specimens bearing free gold.—*Central City Register*, Aug. 30.

GEORGIA.—*The Harris Gold and Silver Mine.*—This mine is located about five miles north-east of Gainesville, and within three or four hundred yards of the Air Line Railroad. The mine was worked over twenty years ago, and it was then believed to be rich, but as no way could then be devised to save the precious metals, it was abandoned. The shaft is at present a little over forty feet deep, and has uncovered a vein five feet thick at the surface, which gradually increases in size until at the depth of forty feet it is eight feet thick. It is in shape something like the letter V reversed—the lines being clearly and plainly marked. The process of sinking the shaft has been tedious, owing to the hard and compact nature of the vein and its surroundings. Both the ore and the binding of the vein had to be blasted; and, owing to the prevalence of metals, the drilling has been quite difficult, and necessarily slow. Several hundred tons of ore have been raised, and are now ready to yield the precious metals which they contain. The mine predominates in silver, but there is also gold and lead in considerable quantities; but in what proportions we are not advised.—Gainesville *Eagle*, August 25.

MICHIGAN.—*The "3 A Silver Mine"* is located on the north shore of Thunder Bay, L. S., and, in common with numerous other mines in this region, is not being worked at present for lack of capital. About two years ago the mine was developed by a couple of shafts which were sunk 166 feet, and levels driven between the same. Considerable ore was raised, when, for reasons above given, the work was abandoned.

Singular Accident at the Duncan Silver Mine, L. S.—A singular accident took place at the Duncan Silver Mine, Thunder Bay, L. S., an account of which may serve as a warning to others. A miner was carrying two dynamite cartridges together with exploder, from store-house to shaft, and, although often cautioned to carry the exploder in his vest pocket, held all together in his hand. He stopped at the door of a blacksmith's shop just as a weld was being made. A spark from the iron either entered the exploder, which is the most probable explanation, or the concussion on the anvil exploded the dynamite. His injuries were very severe, but there is a chance of recovery. His injuries were very severe, but there is a chance of recovery. Had he entered the shop, doubtless the results would have been more disastrous, as there were several men in the shop, all of whom escaped with but a slight scratch. The bones of the hand were driven into the jam of the door and into the shaft-house, some forty feet away. Dynamite is in use at the mine for wet holes, or ground full of vugs. E.

UTAH.—*The Ontario Silver Mine.*—This property is located in a cañon a mile or so above Park City in Summit County. The perpendicular depth of the workings is now 400 feet which makes the 4th level from the surface. At stayes of 100 feet, tunnels each way have been driven from 400 to 600 feet on the ore vein which is surprisingly regular and unchanging, and has not yet given, at any point, a sign of pinching. The tread of the run is diagonally across the cañon. The more valuable ore is found on the end lowest down the creek, and, although refractory in its nature, is valued at about $500 to $800 per ton. This ore is of such a character that it cannot be handled to advantage in the Marsac Mill but will be thoroughly utilized in the 40-stamp mill now in the course of erection near the mine by the company. In the lower levels of the Ontario, the water causes considerable annoyance and requires constant pumping to keep clear. The first pump is on the 200-feet level and is of considerable power and capacity; the next is on the 300-feet level is only a small engine to force the water up to the second level. On the 400-feet level is a new and powerful Knowles pump said to be of a capacity to throw water from a depth of 700 feet to the surface. When we saw this pump it was running to its fullest capacity—one of the other engines being stopped on account of an accident that had recently happened to the boiler. In spite of all these facilities for pumping, it is evident that some means of greater capacity must be used when the workings are carried to a greater depth. The shaft is being widened to about twice its present size in order to give better hoisting facilities. All the lower workings are done merely for the sake of exploration, there being sufficient ore in the upper levels to keep several mills going for three years. Between 70 and 80 men are now employed in the mine under the efficient supervision of Mr. PAT KERVIN. The mine keeps the Marsac Mill in constant action, day and night, producing, with the 20 stamps, one silver brick of about 1,900 oz., 850 fine. Mr. DUNN is superintendent of the mill and keeps everything in first class order. About 30 tons per day is the amount of ore run through the mill, it will, however, be increased to 90 tons upon the completion of the new mill.—*Utah Miner.*

MEXICO.—*The Minas Nuevas Silver Mine* is located on the Palmillo, or Dry Mountain, about three miles from Parral in Chihuahua. This mine is situated on the mother lode from which radiate sixty distinct veins out-cropping upon the surface. The outcrop of the lode is a very red quartz, a color that distinguishes it from all other ore in this district, and which continues, though not so bright as upon the surface, to the bottom of every one of the numerous mines of the vein. The width of the outcrop varies, and while unusually wide throughout its length, it is at many points the widest silver lode I ever saw. Its course from the Dry Mountain, where first seen, is a little to the west of north, and in that direction it extends for six miles without a break to the San Antonio, the last mine on the lode having a name. Beyond this mine the outcrop is not continuous, but it appears every now and then, at short intervals, to a distance of about fifteen miles further, where, the mountains having merged into the plains it is finally lost. Unlike the Prieta, the ore of the Minas Nuevas vein is remarkably free from any of the substances usually termed "rebellious." In none that I saw was there visible any trace of either antimony or zinc blende. The product of the vein is, on an average, five-sixths amalgamating or milling ore, and one-sixth smelting ore. A considerable quantity of this milling ore is used in smelting the black ores of other mines hereabouts. While the proportion of milling and smelting ore above given is the average yet in some of the mines very large pockets exclusively of rich smelting ore have not been infrequent. This was notably so in the San Domingo mine, situated near the center of the vein. This mine, now abandoned and in ruins, was worked as late as 1869, when its owner—an energetic, public spirited Frenchman—died, and his mine, as well as his large estate, went to wreck. The mine is said to be 700 feet deep, and it had nearly reached that depth when he struck a large pocket-out of which in a short time he took 15,000 cargas of rich smelting ore, which yielded $100 to the carga, or nearly $700 to the ton.

There are many mines upon this vein of various depths, but the deepest, Veta Grande, is only 925 feet, and that not a perpendicular depth. At its present depth the owners of this mine are taking out a smelting ore that yields in the adobe furnace from four to eight marks to the carga of 300 pounds, or from 200 to 400 ounces of refined silver to the ton of 2,000 pounds. The width of the vein at this depth is said to be forty varas, or about 115 feet. The history of all these mines is virtually the same. In all respects uniformity of width and sameness of yield, at equal depths, there is no difference. Mines of less than 500 feet in depth have not reached water. Every mine on the vein, except the Veta Grande, is for sale. The highest price asked for any is for the El Salto, which is 260 feet deep. Its owner offered it to me for $15,000, payable in one and two years. When I inspected this mine there were twelve hands only at work in it. They were at work on a large body of smelting ore, whose dimensions, because it was not uncovered, I could not guess at. I purchased 3,000 pounds of the average ore, and in person superintended its smelting. That quantity yielded me ninety-two ounces, or about $65 to the ton. The distance between mines in Mexico is never less than 200 yards along the vein. An individual is entitled to that much, while a company can denounce 800 yards. This exceeds greatly the average extent of mines in the United States. The failure to work these mines may be ascribed to the fact of their greater distance from water, for except in the rainy season, there is no water nearer than some two miles. All the ore taken from a mine is carried to the hacienda of reduction on the backs of burros or asses. These patient, long-suffering little animals constitute in this part of the country almost the only means of transporting freight. The standard load for a burro is a carga (300 lb.), and when the animal is in good condition it is not too much for it.—From Correspondence in *St. Louis Republican*.

STATISTICS OF COAL PRODUCTION.

This is the only Report published that gives full and accurate returns of the production of our Anthracite mines.

Comparative Statement for the week ending Sept. 2.

Tons of 2,240 lb.	1876.		1875.	
	Week.	Year.*	Week.	Year.*
Wyoming Region.				
D. and H. Canal Co.	29,232	1,149,947	58,747	2,123,910
D. L. and W. RR. Co.	38,833	944,613	60,060	2,104,579
Penn. Coal Co	31,121	613,253	30,539	898,822
L. V. RR. Co.	13,764	613,779	22,002	614,001
P. and N. Y. RR. Co.	—	17,488	1,814	74,737
C. RR. of N. J.	31,251	775,105	55,229	732,800
Penn. Canal	927	239,246	16,600	145,232
	145,128	4,353,431	244,991	6,694,084
Lehigh Region.				
L. V. RR. Co.	24,355	1,570,402	88,053	917,963
C. RR. of N. J.	25,312	795,071	32,282	294,075
D. H. and W. B. RR.	1,182	28,479	2,178	51,043
	50,849	2,393,952	122,513	1,263,081
Schuylkill Region.				
P. and R. R. RR. Co.	77 776	2,631,862	171,865	2,393,017
Shamokin & Lykens Va.	12,272	512,725	22,569	810,841
	90,048	3,144,587	194,434	3,203,858
Sullivan Region.				
Sul. and Erie RR. Co.	99	27,599	—	5,557
Total	286,124	9,919,569	561,938	11,166,580
Increase	—	—	—	—
Decrease	275,814	1,247,011	—	—

* Year beginning January 1st.

The above table does not include the amount of coal consumed and sold at the mines, which is about seven per cent. of the whole production.

Perth Amboy business:	Tons.
Received for the week	8,918
Shipped for the week	9,735
On hand Sept. 2	67,166

The decrease of shipments of Cumberland Coal over the Cumberland Branch, and Cumberland and Piedmont Railroads amounts to 362,690 tons, as compared with the corresponding period in 1875.

Belvedere Delaware RR report.	Week.	Year 1876.	Year 1875.
Receipts of coal at Coal Port (Trenton)	1,454	163,550	72,381
" " " South Amboy	772	291,562	121,006
Shipments at Coal Port (Trenton)	4,803	161,890	70,040
" South Amboy	7,318	313,545	177,477

Receipts of Coal at Boston, for week ending Aug. 31, and years from September 1st, 1874 and 1875.

From	Week. Tons.	Previously. 1876. Tons.	1875. Tons.
Alexandria and Georgetown	3,592	90,666	112,142
Philadelphia	12,319	647,014	532,166
Baltimore	5,065	153,317	170,277
Other places	11,483	298,072	259,577
Great Britain	—	4,722	3,397
Nova Scotia	1,135	24,416	31,195

The Production of Bituminous Coal for the week ending Sept. 2, was as follows:

Tons of 2,000 lb., except where otherwise designated.

	Week, Tons.	Year, Tons.
Cumberland Region, Md.		
Tons of 2,240 lb.	45,151	1,177,834
Barclay Region, Pa.		
Barclay RR., tons of 2240 lb	7,634	221,075
Broad Top Region, Pa.		
Huntingdon and Broad Top RR	2,179	105,614
*East Broad Top	1,155	47,501
Clearfield Region, Pa.		
*Snow Shoe	668	35,328
*Tyrone and Clearfield	22,138	766,162
Allegheny Region, Pa.		
*Pennsylvania RR	4,066	139,497
Pittsburgh Region, Pa.		
*West Penn. RR	3,558	132,640
*Southwest Penn. RR	788	38,907
*Penn. & Westmoreland gas coal, Pa. RR.	19,653	526,252
*Pennsylvania RR	7,699	174,421

* For the week ending Aug. 28.

The Production of Coke for the week ending Aug. 28.

Tons of 2000 lb.	Week.	Year.
West Penn. RR	672	31,129
Southwest Penn. RR	11,291	339,125
Penn. & Westmoreland Region, Penn. RR.	1,427	33,323
Pittsburgh, Penn. RR	1,840	112,706
Total	15,230	516,283

COAL TRADE REVIEW.

NEW YORK, FRIDAY EVENING, Sept. 8, 1876

Anthracite.

THE excitement caused by the breaking of the Combination, and the auction sale which followed, having passed away, business is resuming its old channels again; and they appear strikingly familiar. Outside of those coals that offer concessions business is but slightly increased over what prevailed previous to the disruption of the Combination. Most of that doing is by dealers who made purchases at auction, and who can make very good profits by selling at a liberal concession from the prices named in regular circulars. Of course, the lower prices have increased business somewhat, and are likely to continue to do so. We know of one bituminous coal company that has had orders for 20,000 tons countermanded, owing to the lower prices ruling for anthracite, and we have no doubt that the aggregate quantity of soft coal countermanded from the same cause has been very large. However, there is but little inclination to stock up heavily at the prices now current, and as the actual requirements of the market cannot be suddenly increased to any great extent, the business during the balance of this year will not probably exceed that which would have ruled had prices continued on the higher level. Furnacemen will not blow in till they have become satisfied that the low prices are likely to continue, and till freights and other things have gone down in sympathy with coal. That such will ultimately be the case cannot be doubted, but it will take some time to convince the iron men that they can safely go to work, and can make iron at that lower price which will command a larger market.

The disquieting rumors concerning one of the large coal companies are also unsettling the market, and the possible eventuality of a receiver is greatly disturbing the equanimity of the other companies, for it might lead to such cutting of even present low and unremunerative rates on coal and transportation as would seriously endanger other interests.

There are no indications of higher prices at an early day, but rather over-production on every side, which must eventually be regulated by prices, that will make it unprofitable for some and impossible for others to continue producing. Even then the more profitable business will come rather from reduction in cost of producing than in much higher selling prices.

So far as we can interpret the signs of the times there seems to be no indication of high prices in coal for some time, probably for some years to come. The

men are in no condition to oppose, by any long-continued strike the reductions in wages that have become inevitable, and the productive capacity of our mines is quite sufficient to supply a much greater demand than we are likely to have for the next year or two. Many things point to a full production at even quite unremunerative prices, and it is natural to suppose that a very slight betterment in these would result in drawing out an excessive supply.

The New York Lehigh Coal Exchange has adopted the following prices for shipments at Elizabethport, Port Johnston, and Perth Amboy :

Lump	$4 00
Broken	3.60
Egg	3.60
Stove	4.00
Chestnut	3.30
Pea	2.75

The following prices of coal at Mauch Chunk, for line trade, have been adopted :

Lump	$2.75
Broken and Egg	2.80
Stove	3.00
Chestnut	2.50
Pea	1.50
Lump to furnaces	2.50

The quotation for "Furnace Lump" is higher than had been anticipated, but as no one will be "hung" for selling at a lower rate, there is no doubt that the furnace companies will get their coal at a figure but little above actual cost of delivery.

It is said that a great many suits will be brought against the several companies, by parties who purchased coal at circular rates, previous to the Combination breaking. Claims are being considered by some of the companies, and in certain cases have been adjusted.

It is not officially announced what companies will sell coal at auction, or what quantities will be sold, but it is intimated that considerable coal will be disposed of in this manner. Should such be the case we are likely to see still greater demoralization in the trade, for as buyers would soon learn to depend upon the sales for their entire supplies, no large amount of coal could be sold except in this way, and so long as over-production continued, ruinously low prices would prevail.

According to our statistics of the production of anthracite coal, there was a decrease this year from JAN. 1 to Sept. 2, of 1,247,011 tons, as compared with the corresponding period of last year. There was a loss of but 100 tons July 22d, so that this large decrease has taken place in six weeks, or at the rate of over 200,000 tons per week. It is very probable that the average decrease until the end of the year will be fully 150,000 tons per week, as was estimated by us in our issue of July 22d. This would result in a decrease for the year of about 3,500,000 tons as compared with 1875.

To Sept. 2d, the Delaware and Hudson Canal Company showed a decreased production as compared with the corresponding period of 1875, of 973,963 tons, or 38 per cent.; Delaware, Lackawanna and Western Railroad Company, 1,159,966 tons, or 55 per cent. ; Pennsylvania Coal Company, 285,569 tons, or 32 per cent.; while in making similar comparisons, the Lehigh Valley Railroad Company shows an increase of 617,007 tons, or 38 per cent. ; New Jersey Central Railroad Company, 574,248 tons, or 61 per cent.; and the Philadelphia and Reading Railroad Company, 238,845 tons, or 10 per cent. It must be borne in mind, however, that the three latter companies had strikes, on the lines of their roads, which lasted from January 1st to July 1st of last year.

THE ANTHRACITE COAL ASSOCIATION.

BUFFALO, Sept. 2, 1876.

The resolution adopted August 19, 1876, allowing a draw-back of twenty-five cents per ton on coal paid for in cash, on or before the fifth day of the month succeeding shipment, was rescinded August 31, 1876.

The prices given in circular dated September 1, are for cash only, and are subject to fluctuation at any time.

C. M. UNDERHILL, General Salesman.

Bituminous.

With the exception of such shipments as are being made in old contracts, there is but very little doing. Many conditional orders have been countermanded, and, upon the whole, the outlook for this interest is a very gloomy one. The mining companies partially realize the position, and feel that they will not be able to do much business unless they receive help from the carrying companies ; but it is also certain that they must help themselves, and the only way to do that is by introducing every possible economy, and by sweeping reductions in wages. There is little to be hoped from the present management of the Consolidation Coal Company, but it will be interesting to know how they will defend, to their stockholders, at the next annual meeting, a policy which has resulted so disastrously to the company itself, and to the entire region from which it has to get its income.

Coal Trade of Philadelphia.

PHILADELPHIA, Sept. 7, 1876.

From our Special Correspondent.

THE low prices have caused much activity in the anthracite coal trade here. The time for laying in Winter supplies is at hand, and many are convinced that coal has reached its lowest point. The wages will have to be adjusted to the new schedule of prices. The parties who bought Reading coal at auction are anxious to have it shipped promptly, and this has caused a sudden rise in freights. Rates are now $1.20 to Rhode Island ; $1.30@$1.35 to Boston; 80c. to Washington; 75c. to Richmond, and 60c.@65c. to Norfolk.

Wholesale Prices of Anthracite Coal for Sept., f.o.b. at the Tide Water Shipping Ports per ton of 2240 lb.

	Lump.	Steamer.	Grate.	Egg.	Stove.	Chestnut.
Wyoming Coals.						
‡Lackawanna and Scranton at Hoboken and Rondout	3 25	3 25	3 50	3 50	4 15	3 75
Pittston at Newburg	3 10	3 10	3 35	3 35	4 00	3 60
Wilkesbarre at Port Johnston	3 25	3 25	3 50	3 50	4 00	3 50
Plymouth, R. A.	....	....	3 50	3 50	4 15	3 40
Susque. Coal Co. at Amboy W.A.	3 25	3 25	3 50	3 50	4 00	3 30
Kingston at Hoboken	3 25	3 25	3 50	3 50	4 00	3 30
Lehigh Coals.						
Old Company at Port Johnston	4 00	....	3 60	3 60	4 00	3 30
Old Company's Room Run "	4 00	....	3 60	3 60	4 00	3 30
Sugar Loaf, Hobok. & Amb. "	4 00	....	3 60	3 60	4 00	3 30
Lehigh Coal Exchange "	4 00	....	3 60	3 60	4 00	3 30
Honey Brook Lehigh	4 00	....	3 60	3 60	4 00	3 30
Beaver Meadow at South Amboy	4 00	....	3 60	3 60	4 00	3 30
Schuylkill Coals at Philadelphia.						
Schuylkill white ash	3 00	3 00	3 00	3 00	3 50	3 00
Schuylkill red ash	....	....	....	3 10	3 60	3 00
Lorberry	....	....	4 00	4 00	4 00	3 05
Lykens Valley	....	....	4 50	4 50	4 50	3 50

‡ Boats towed by the D. & H. C. Co. at its expense to and from New York harbor.

	Per ton.
Freight from Hoboken and Weehawken to New York	40c.
" " Elizabethport & Port Johnston to N. York.	40c.
" " South Amboy to New York	35c.

Freight by the boats of the companies from Hoboken, Port Johnston, Weehawken, Rondout, South Amboy and Perth Amboy to New York City and vicinity 50c.

Freight by the Pennsylvania Coal Company's boats from Newburg to New York 65c.

The prices of Susquehanna coal at Philadelphia are, on lump and steamer, 25 cents per ton less ; broken, egg, and stove, 50 cents per ton less ; chestnut, 30 cents per ton less than at South Amboy.

Lackawanna coal delivered to carts in New York or Brooklyn, 50 cents per ton additional.

Wholesale Prices of Bituminous Coal.

Domestic Gas Coals.

Per ton of 2240 lb.	At the Shipping Ports.	Alongside in New York.
Westmoreland and Penn. at Greenwich, Philadelphia	$4 70	$6 00
" " at S. Amboy	5 50	6 00
Red Bank Cannel Pa. at Philadelphia	8 00	8 50
" " South Amboy	8 50	....
" Orrel	6 00	6 50
Youghiogheny, Waverly Co., at Balt.	4 25	5 75
Despard, West Va.	4 50	6 00
Murphy Run, West Va., at Baltimore	4 50	5 85
Fairmount, West Va., " "	4 40	5 70
Newburgh Orrel, Md. " "	4 50	6 00
Cannelton Cannel, W. Va.	....	10 00
" Splint, " at Richmond.	4 50	6 00
" Gas Coal at Richmond.	4 00	5 50
Peyiona Cannel W. Va. at Richmond	....	10 00

Manufacturing and Steam Coals.

Cumberland at Georgetown and Alexandria, Va	3 50@3 75	4 90
Cumberland, at Baltimore	3 65@3 80	5 10
Clearfield f.o.b. Canton, Baltimore	3 75@....	5 25

Rockhill Semi-Bituminous and Broad Top, at the mine, per 2,000 lb., 95, f. o. b. Greenwich, Philadelphia, per 2240 lb., $3 60@3 95, according to destination; at South Amboy, N.J., 4 60; New York, 5 00.

Clearfield and Allegheny, "Kittanning," "Sterling," "Sonman," and "Eureka," at the mines, per 2000 lb., 95 ; at Greenwich, Phil., per 2240 lb., 3 75@4 25, according to destination ; f.o.b. South Amboy, N. J., 4 75 ; New York, 5 25.

Foreign Gas Coals.

	Sterling.	Am. cur'cy.
Newcastle, at Newcastle-on-Tyne	9/6@11/	6 50@ 7 00
Liverpool House Orrel, at Liverpool	26/	13 00
Ince Hall Cannel "	42/	18 00
" Gas Cannel "	28/	13@14
Scotch Gas Cannel, at Glasgow, nominal,	25/	7 50
	Gold.	
Block House, at Cow Bay, N. S.	2 00	4 75
Caledonia, at Port Caledonia	1 50	4 25
Glace Bay, at Glace Bay	1 50	4 25
Lingan, at Lingan Bay	1 75	....
Sydney, International and Reserve mines, at Sydney	2 00	5 50
Pictou, Albion & Vale mines, at Pictou.	2 25	5 75

Retail Prices in New York.

Anthracite.

Per 2000 lb.	Grate and Egg.	Stove.	Chestnut.
Pittston coal, in yard	$4 20	$4 50	$3 80
Lackawanna coal, in yard	4 20	4 50	3 80
Wilkes-Barre, delivered	5 00	5 30	4 60
Lehigh & Locust Mountain, del'd	5 50	5 50	5 00
Schuylkill Red Ash, del'd	6 00	6 00	5 50

The Cost of delivery for Pittston and Lackawanna coal ranges from 40 cts. to $1 10 per ton, according to distance from the yard.

Bituminous.

Liverpool House Orrel, delivered, per ton of 2000 lb	$18 00
Liverpool House Cannel " " "	22 00
American " " "	13 00
Cannelton splint, " "	7 50
Cannelton Block, " "	7 50
American Orrel " "	11@14
Red Bank Cannel " "	10 00
Cumberland " "	7 00

Baltimore, Md. Sept. 5, 1876.

Reported by our Special Correspondent.

ANTHRACITE.

Wholesale or Trade Prices per 2240 lb.

Wilkes-Barre "Lee" or "Diamond," Pittston and Plymouth. White ash.	In cars at depot.	By boats afloat.
Lump and steamboat	$4 87	$4 72
Broken	5 25	5 10
Egg	5 35	5 20
Stove	5 76	5 61
Nut	4 91	4 76
Shamokin. (red or white ash), and "Boston," free burning white ash,		
Egg	5 35	5 20
Stove	5 75	5 60
Lykens Valley, red ash,		
Egg and stove	6 30	5 73

From wharf or yard, wholesale, 50@75c. additional.

By retail, all kinds and sizes, per 2240 lb. $2 50@8 00

BITUMINOUS.

George's Creek, Cumberland f. o. b. at Locust Point	3 75@4 00
West Virginia Gas f. o. b. at Locust Point	4 50
Youghiogheny Gas, f. o. b. at Locust Point	4 50
Swanton	4 00

Boston. Sept. 2, 1876.

COAL has been decidedly active since the auction, the business of the week just past having been the largest ever aggregated in this market. The sales are thought to run above one hundred thousand tons, largely in chestnuts, which are again a favorite size with steam users. The auction was a sad surprise to the yard men and agencies here, the prices realized running from $1 to 75c under the temporary prices announced a week ago. This sharp decline is as illegitimate as were the Combination rates previously, and the reaction has already commenced ; the contract prices telegraphed over Thursday and which are about 25c. under the prices named to tide over the auction, have been very generally accepted as low and satisfactory.

As the street has been cleaned up of all the vesse's offering, chiefly to move the purchases of the week, which are immediately held by the manufacturers, the water power in all directions being now insufficient for motive purposes, the auction buyers are very anxious over their ability to move their purchases at the specified time, in accordance with article 3 of conditions of sale.

It would seem, however, as though the companies had sold coal enough at their recent quotations to induce them to do all they could to keep their men at work. The market will undoubtedly be full of competition and rumors out of which the buyers must cautiously sift their proper opportunities for purchases.

The meeting of the retail coal trade on Wednesday noon was attended by about 120 dealers from Boston and vicinity. There was very little said ; the offering of a resolution to retail at $6 for stove and $5 50 for furnace provoked no comment It was generally understood as a concession of 50c. a ton to the trade on the part of one heavy auction buyer, hence, while the reduction was $1 50 under the previous rates, it was as little as could reasonably be expected. In bituminous coals there is a small trade at a basis of $5 10 for Cumberland and $5 50 for gas coals. In Provincial coals two or three cargoes have been placed at $4 25 for Cape Breton and $5 for Pictou.

FREIGHTS are nominally higher than even a week ago, when the quotations were from New York, $1 to $1 10, and from Philadelphia $1 20 to $1 35. Baltimore rates are unchanged from $1 35.—*Commercial Bulletin.*

Buffalo, N. Y. Sept. 1 , 1876.

Reported by LEE & LOOMIS.

Deliv'red at	Elmira	Ithaca.	Syracuse.	Rochester.		Oswego
	Afloat	Afloat.	Afloat.	Afloat	ret. del.	f.o.b.
Grate	$3 80	$2 95	$3 10	$3 80	$5 05	$4 05
Egg	3 80	2 95	3 10	3 80	5 05	4 05
Stove	4 20	3 40	3 55	4 25	5 50	4 50
Nut	3 90	3 10	3 25	3 95	5 20	4 20

Delivered at	Erie.	Buffalo.		
	f.o.b.	Afloat.	f.o.b.	ret. del.
Grate	$4 55	$4 05	$4 55	$5 30
Egg	4 55	4 05	4 55	5 30
Stove	5 00	4 50	5 00	5 75
Nut	4 70	4 20	4 70	5 45

Chicago, Ill. Sept. 5, 1876.

No change in prices of coal. Trade quiet.

Cincinnati, O. Sept. 5, 1876.

Reported by our Special Correspondent.

Per ton of 2000 lb.	Bush.	Ton.
Youghiogheny, or Pittsburgh, afloat	7½@8c.	—
Pomeroy coal, "	5 @5½c.	—
Kanawha " "	7 c.	—
Cannel coal, according to quality "	10 @16c.	—
The following are the retail prices delivered		
Youghiogheny		10c.
Pomeroy		8c.
Cannel		15@22c.
Kanawha Semi-Cannel		10c.
Anthracite, per ton		10 50@11 00
Coke, at yard		7c.
Coke, hard and soft, delivered		9@10c.

Cleveland, O. Sept. 5, 1876.

Specially reported by Messrs. LAMBIE & BATES.

Our Coal Exchange meets to-morrow evening to fix prices on hard coal. We expect advices from the East to-morrow, as to Western schedules. Will advise you as soon as we arrange the new scale of prices. So far our market in anthracite has not changed.

Per ton of 2000 lb. f. o. b. vessels.

WHOLESALE.

	For vessels,	On cars.
Youghiogheny Gas Coal	$4 10	$4 00
Cannel	4 25	4 15
Blossburgh	$5 00	$5 00
Briar Hill, Block Coal	3 50	3 25
Straitsville Coal Co., lower vein	2 90	2 90
" " " whole "	2 80	2 80
Hocking Valley	2 90	2 90
Massillon	2 90	3 00
Tuscarawas Valley	2 50	2 50
Columbiana	2 50	2 50

Office of CLEVELAND COAL EXCHANGE,

89 Seneca Street, June 3d, 1876.

PRICES TILL FURTHER NOTICE.

	1 to 10 tons.	10 tons upw'd.
Massillon, Brier Hill and Mineral Ridge, lump	$4 00	$3 75
" " " " nut	3 75	3 50
Straitsville Lower Vein, Hocking & Shawnee, l'p	3 10	3 40
" " " " nut	3 40	3 15
Del Carbo and Rich Hill, lump	3 75	3 40
" " " " nut	3 45	3 10
Columbiana, lump	3 95	3 00
" nut	2 75	2 55
Lackawanna and Wilkesbarre, egg and grate	7 50	7 30
" " stove	8 00	7 75
" " chestnut	7 75	7 51

No Anthracite coal to be sold for future delivery except to be subject to Exchange price at time of delivery.

H. E. CHUBB, Secretary.

Indianapolis, Ind. Sept. 5, 1876.

Specially reported by Messrs. COBB & BRANHAM.

Wholesale on board cars, and retail delivered to consumers. Per ton of 2000 lb., bushel of 70 lb.

BITUMINOUS.

White River, per ton	$2 50	Peytona cannel, per ton	5 75
Brazil Block, "	2 50	Indiana Cannel	4 50
Highland, grate, "	2 25	Hocking Valley	4 25
Block coal, nut, per car	18 00	Youghiogheny	4 50
Highland " "	18 00	Blossburg (smithing)	6 50
Block Slack "	17 00	Piedmont "	6 50
		Gas coke, per bushel	10

ANTHRACITE (Lackawanna and Wilkes-Barre.)

Broken	$8 35	Nut	8 50
Egg	8 35	Stove	8 75

Lehigh Anthracite.

Broken	9 75	Nut	9 50
Egg	9 75	Stove	10 00

Retail, per bushel, delivered.

Sand Creek	15c.	Block Nut, steam	8
White River	13	" Slack, "	7
Brazil Block	14	Peytona Cannel	28
Highland grate	13	Virginia "	27
Block Nut, domestic use	12	Youghiogheny	20
Highland Nut, " "	12	Blossburg	26
" " steam	8	Piedmont	26

GAS COKE (measured.)

Crushed	15c.	Lump	12c.

ANTHRACITE,

Wilkes-Barre and Lackawanna (all sizes) $9 75 per ton,
Lehigh, retail $11 50 per ton.

Louisville, Ky. Sept. 5, 1876.

Specially reported by Messrs. BYRNE & SPEED.

Please report our prices as follows:

WHOLESALE.

	per bushel		per bushel
Pittsburgh	12c.	Pine Hill	—
Raymond City	9c.	Kentucky	8c.

RETAIL.

	per bushel		per bushel
Pittsburgh	12c.	Peytona Cannel	20@22c.
Raymond City	11c.	Buckeye "	20c.
Pine Hill	13c.	City-made Coke	10c.
Kentucky	10c.	Anth., per ton, $10 00 to 10 50	
Screened Pittsburgh per load			$3 00
Screened Raymond City			2 75
Pine Hill (Kentucky)			2 75
Cannel			$5 to 5 50

Milwaukee, Wis. Sept. 5, 1876.

Specially reported by Messrs. B. P. ELMORE & Co.

Trade is quiet. Our prices for coal are:

Retail price per ton of 2000 lb.

Lehigh Lump	$ 9 00	Briar Hill, select	$7 00
Lehigh Prepared	9 50	Blossburgh	7 00
Lackawanna (all sizes)	8 50	Cannel	8 00
Pittston	8 50	Pittsburgh	6 50
Scranton	8 50	Steam coal	5 50

New Orleans, La. Sept. 1, 1876.

Reported by C. A. MILTEBERGER & Co.

There were on hand at Willow Grove Coal Landing, September 1st, 190 boats, 10 barges and 7 French creeks of coal and 3 boats of St. Bernard Coal Company's coal. The consumption during August was 13 boats, 6 barges, and 3 French creeks of Pittsburg coal, and 2 boats of St. Bernard.

The market is extremely dull at present, with low prices, no demand, and a fair stock. We quote, viz.:

Pittsburg coal, retail, per bbl	5 c.
" wholesale	30c
" steamboats, per box	40c.
" to manufacturers	45c.
" shipments, per hhd	$5 50
Anthracite, wholesale, per ton	
" retail, "	12 00
Virginia Cannel, per bbl	80c.
Scotch " "	80c.
Mt. Carbon, wholesale, per bbl	
" " retail, "	50c.
St. Bernard wholesale, per bbl	30c.
" retail, "	45c.

Richmond, Va. Sept. 4, 1876.

Specially reported by S. H. HAWES, Dealer in Coal.

Prices are now as follows:

Per ton of 2240 lb., f.o.b.

Kanawha Cannel	$9 00	New River Bituminous	$4 00
" semi-Cannel	4 00	Clover Hill Coal	3 50
Coalburgh Splint	4 00	James River Bitum	3 30
Lewiston "	4 00	" " Carbonite	5 00
Kanawha Gas coal	3 90		

San Francisco, Cal.

From the *Commercial Herald*, Aug. 31, 1876.

Imports from Jan. 1st to Aug. 29:

	tons.		tons.
Anthracite	9,238	Vancouver Island	67,783
Australian	75,496	Rocky Mountain	152
Coos Bay	26,039	Seattle	63,814
Cumberland	7,527	Bellingham Bay	15,895
English	33,783	Chili	2,076
Mt. Diablo	65,590		

At this writing there are very few spot cargoes here unsold. Those afloat in our harbor were mostly bought to arrive. The quantity now en route from England and her colonies is unprecedentedly large and has a very depressing effect upon Pacific Coast mines as well as those of British Columbia. At this writing it is computed the quantity of all sorts afloat destined to this port, including anthracite Cumberland, English, Scotch, and Australian, cannot be less than 150,000 tons. Of this about one half is Scotch and English steam—a large portion of the last two sold under contract between the range of $8.50@7.50, the latter rate for the most recent shipments. The arrivals since our last weekly reference embrace the following cargoes: *Glory of the Seas*, Liverpool, 2,500 tons; *Brodick Castle*, 2,500 tons, Newcastle, N. S. W.; *Assaye*, 1,694 tons same; *St. Charles*, 1,210 tons, Liverpool; *Fiji*, 2,099 tons, Newcastle, N. S. W.; *Warwick*, 1,400 tons, do.; *Sevenas*, 1,166 tons same; *Seaforth*, 1,720 tons, Liverpool; *City of Panama*, 600 tons, Nanaimo, B. C.; *Lookout*, 1,325 tons, Bellingham Bay; *Cartsburn*, 1,750 tons Scotch from Dundee; *Enterprise*, 500 tons, Coos Bay; *Revere*, 1,200 tons, Wellington, B. C.; *Orpheus*, 1,350 tons, Nanaimo; *Triumphant*, 2,376 tons, Liverpool; *City of Nankin*, 1,315 tons, Newcastle, N. S. W. We quote the price of Australian steam $8; West Hartley, ditto, is held a trifle higher. Quotations for all other kinds low and nominal. New York, August 29th—A despatch of this date to the Merchants' Exchange gives details of the large auction sale of 500 000 tons anthracite as follows: Steam. $2@3; grate, $2.67½@3; broken, $2.45@2.85; egg, $2.07½@3.25; stove, $2.52½@3.90; chestnut, $1.75 @3.42½; lump, $2.50.

Montreal. Sept. 1, 1876.

Specially reported by Messrs. ROBERT C. ADAMS & Co.

Our bituminous coal market continues lifeless. About $3.90 to $4 would be paid for Scotch Steam, but Pictou Coal cannot be sold in competition with prices, and all that comes up is put in yard. Welsh anthracite has been sold at $5 to $5.70 for large quantities.

The anthracite market is at a standstill, consumers demanding a reduction. As dealers have already laid in most of their Winter stock, they are loth to recognise the collapse in the American market, but they will, no doubt, have to make concessions. Quotations are unchanged.

Wholesale per ton of 2240 lb.

Scotch Steam	$4 25	Cape Breton Steam	$3 75
Pictou "	4 25	Newcastle Smiths	5 50

Anthracite at retail, per 2000 lb., delivered.

Egg	$6 25	Chestnut	6 25
Stove	6 75		

Toronto, Ont. Sept. 4, 1876.

Chestnut	$7 25
Stove	7 50
Egg and grate	7 25
Bituminous coal for domestic use	6 00
" " steam	3 50@5 50
Lehigh Lump and broken	7 50
Blossburgh	6 50

Rates of Transportation on Anthracite Coal to Tide Ports.

OFFICE OF THE PA. & N. Y. R. R. Co.,
Bethlehem, Sept. 1st, 1876.

On and after this date the rate on coal for Buffalo, for Watkins, Ithaca, and Weedsport, for water shipment; Auburn, for New York Central R. R.; Sterling, for Lake Ontario Shore R. R. and Fair Haven, will be 98 cents per gross ton, between Coxton and Waverly. On Coal for Rochester, via Erie R. W., Salamanca and points west thereof, an additional charge of 10 cents per ton will be made to cover transshipment charges at Waverly.

ROBERT H. SAYRE,
President.

RATES VIA MORRIS & ESSEX DIVISION DELAWARE, LACKAWANNA & WESTERN RAILROAD AND THE LEHIGH VALLEY RAILROAD.

(Per 2240 lb.)

Penn Haven to Mauch Chunk	74
Mauch Chunk to Phillipsburg	44
Phillipsburg to Hoboken, Port Johnson, or Perth Amboy	65
Penn Haven to tide	$1.23
Phillipsburg to Newark	1.01

Schuylkill Coals.

per ton of 2240 lb.

	From Pine Grove	From Tamaqua.	From Schuylkill Haven.
To *Port Richmond*, for shipment, via P. & R. R. R., Main Line	1 20	1 15	1 00
Philadelphia, Retail yards	1 45	1 40	1 25
Harrisburg, via Lebanon Valley Branch	98	1 37	1 22
Allentown, via East Pennsylvania Branch	1 22	1 17	1 02
Lancaster, and Points on Lancaster Branch, via R. & C. R.R.	1 30	1 25	1 10
Dauphin, via Schuylkill and Susquehanna Branch	70	1 18	1 03
Slatedale Junction via Berks and Lehigh Branch	1 34	1 29	1 14
Lebanon, via Lebanon and Tremont Branch	81	....	....

From *Tamanend* to *Catawissa*, via Catawissa and Williamsport Branch Railroad 90
From *Tamanend* to *Williamsport*, via Catawissa and Williamsport Branch Railroad 1 25

Coal sent to points on the Catawissa and Williamsport Branch will be charged one and one-half cent per ton per mile, and two cents per ton additional to Tamanend.

From *Port Clinton* to *Philadelphia* via Schuylkill Canal, including freight and charges for the use of cars and barges, and for tolls (exclusive of cost of unloading 1 00

For shipment via Main Road or Schuylkill Canal, one and one-half cents per ton per mile, and two cents per ton additional, to Port Carbon, Mount Carbon, Schuylkill Haven, Pine Grove, Tamaqua, or Port Clinton, for Canal, as the case may be.

Coal sent to points on the Catawissa and Williamsport Branch will be chargad one and one-half cent per ton per mile, and two cents per ton additional to Tamanend.

For consumption at local points in coal region, including Shamokin, Herndon, Schuylkill Haven, Pine Grove, and Pamaqua, three cents per ton per mile, and two cents per ton additional; and a charge for *car service*, of fifteen cents per ton to individuals, and five cents per ton to manufacturers, when in Philadelphia and Reading Railroad cars.

Sent westward via Northern Central Railway (in N. C. R. W. Co.'s cars), four and two-tenths cents per ton per mile, to Locust Gap, Shamokin, or Herndon.

No charge will be made less than twenty-five cents per ton, including freights, tolls, and car service.

One mile extra will be added for coal passing through the East Mahanoy Tunnel.

Fractions of distances and rates will always be stated in *tenths*.

No charge will be made for weighing or making returns of coal shipped, and the latter will be furnished free of charge, upon application to the Weighmaster; if these returns are to be sent by mail, envelopes, properly stamped and addressed, must be furnished to the Weighmasters.

All coal will must be charged the rates (both lateral and Main Line) current on the day it is weighed; it will also be way-billed on the same day.

Freights on Bituminous Coals from the Mines to Tide Water Shipping Ports.

From the Mines to Cumberland and State Line (say an average of 20 miles), the legal charge is 2 cents per ton of 2240 lb. per mile.

From State Line to Amboy (346 miles) $4 per ton of 2000 lb. On coal shipped beyond this point there is a drawback of 75 cents per net ton.

From Cumberland to Baltimore (178 miles) $2.02 per ton of 2240 lb., or $1.80 per net ton (¼ cent per ton per mile for use of hoppers over C. & P. RR.).

From Cumberland to Georgetown (152 miles) by canal, $1.10 Tolls, 46 cents.

From the Mines to Piedmont, 4 cents per ton of 2240 lb. per mile on distances less than 4 miles, and 3 cents per ton per mile on distances over 4 miles, and 2 cents per ton per mile on distances over 10 miles.

From Piedmont to Baltimore (206 miles) $2.34 per ton of 2240 lb., or $2.08 per net ton.

From Osceola to Greenwich, Phila. (say 248 miles) per T. & C RR., per ton bituminous coal of 2000 lb., less drawback of $1.46. $2.15; rate per gross ton, $2.60.

From Osceola to South Amboy, N.J., (317 miles) per 2000 lb., $4.03, less drawback, $1.03; rate per net ton, $3; add 12 per cent. for gross ton, 36 cents, terminal expenses, shipping, 20 cents; rate per gross ton, $3.56.

Freights

Representing the latest actual charters up to Sept. 7, 1876.

Per ton of 2240 lb.

PORTS.	From Philadelphia.	From Baltimore.	From Georgetown.	From Elizabethport, Port Johnson, South Amboy, Hoboken and Weehawken.
Augusta, Me	....	1 50	....	....
Albany	....	1 50	....	....
Alexandria	....	65	....	....
Amesbury, Mass	....	....	....	....
Bangor, Me	....	1 50	....	90
Bath, Me	....	1 40	1 40	90
Baltimore	....	....	....	....
Boston, Mass	1 30@1 35	1 40	1 50	90
Bridgeport, Ct	....	1 35	....	55
Bristol, R. I	....	....	....	80
Cambridgeport, Mass	....	....	....	90
Derby	....	....	....	....
Dighton	....	....	....	....
East Cambridge	....	....	....	§90
Fall River	....	1 40	1 40	80
Hackensack	....	....	....	....
Hallowell, Me	....	....	....	....
Hartford	....	1 90	1 65	90
Hoboken	....	1 25	1 25	40
Hudson	....	1 40	1 40	....
Jersey City	....	....	1 25	40
Lynn, Mass	....	....	....	† 90
Middletown	....	....	....	80
Mystic	....	....	....	....
Newark	....	1 40	1 30	....
New Bedford	....	1 40	1 40	80
Newburyport	....	1 55	1 60	1 00
New Haven	....	1 35	1 40	55
New London	....	1 35	1 40	65
Newport	....	1 45	....	80
New York	....	1 30	1 25	40
Norfolk	60@65	60	....	....
Norwalk	....	1 40	....	60
Norwich	....	1 40	1 45	70
Pawtucket	....	1 60	....	....
Philadelphia	....	80	....	....
Portland	....	1 35	1 40	90
Portsmouth, N. H	....	1 55	1 60	1 00
Providence	....	1 35	1 40	80
Poughkeepsie, N. Y	....	....	....	....
Rockport	....	....	....	....
Saco	....	....	1 80	....
Sag Harbor	....	1 40	....	1 00
Salem, Mass	....	1 40	1 60	90
Salisbury Pt., Mass	....	....	....	....
Stamford	....	....	....	60
Stonington	....	....	....	80
Taunton	....	....	....	....
Troy	....	1 60	....	....
Warren, R. I	....	....	....	80
Wareham	....	1 50	1 50	....
Washington	80	65	....	....
Weymouth	....	....	....	....
Wilmington, Del	....	80	....	....

* And discharging and towing. † And discharging. ‡ And towing. § 3c. per bridge extra.

IRON MARKET REVIEW.

New York.

FRIDAY EVENING, Sept. 8, 1876.

American Pig.—We note sales of 500 tons of Thomas Iron Company's iron Nos. 1 and 2 x and 200 tons of Crane all at quotations. One or two of the prominent iron companies appear to be well supplied with orders, but the others continue to complain of a lack of business. We quote No. 1 foundry at $22 ; No 2, $20 ; and forge, $19@$20.

Scotch Pig.—There is but very little business doing in this article, the quantities sold hardly being sufficient to establish prices. We quote Eglinton, $26 ; Glengarnock, $27 ; Coltness, $28.

Rails.—Without business we quote iron rails at mills at $39@42, and steel, at $52@54.

Old Rails.—We are reported sales aggregating 5,000 tons, at $20.

Scrap.—Wrought is without business at $27@28.

Philadelphia Iron Trade.

Weekly report of the Philadelphia Iron Market, furnished by Messrs. JUSTICE, COX, JR., & CO., Iron Merchants, 333 Walnut Street, Philadelphia. Week ending Sept. 7, 1876.

BUSINESS continues dull, with a little more inquiry than for some weeks, buyers evidently feeling the market in hopes that the lower price of coal would crowd the already almost crowded out producers of pig iron a shade lower in their prices, but as yet we do not hear of any lower price; in fact, we know of an offer for a round lot, refused at a small concession in price. The producers contending they have been selling at a loss for some time, and if they are to receive any benefit of lower coal, they do not propose to give it away. Forge is scarce and in demand We quote, $22 to $22.50 for No. 1, $20 to $20.50 for No. 2, and $19 to $19.50 Gray Forge. Report sales of 500 tons Crane Gray Forge, at $19.50. 200 tons No. 2xMontgomery, at $20.

BAR IRON.—Manufactured iron is the dullest thing in the iron market, consumption is less and less every week. We hear of a small concession in prices by the Philadelphia Mill, but we fear this will bring no new business, and in the face of the small stock of forge iron, very poor policy. We quote, $2.25 to $2.35 per lb.

RAILS.—Nothing doing in new contracts. There are a few inquiries in the market, but as there is no cash in it the orders are not easily placed. Mills are rather shy of the securities offered. We quote, $56 to $58 for steel, $38 to $42 for iron rails.

OLD RAILS dull of sale at $22 to $22.50. We quote wrought scrap at $25 to $27.50. Cast, $16 to $19.

Baltimore. Sept. 6, 1876.

Specially reported by Messrs. R. C. HOFFMAN & Co.

The iron market continues dull and depressed, with small sales at quotations.

Baltimore Charcoal	$30@34	Anthracite No. 3	$20@21 00
Virginia Charcoal	28@34	Mottled and White	17@19 00
Anthracite No. 1	24@25	Charcoal C. B. Blooms	63@65 00
" No. 2	22@23	Refined Blooms	50@55 00

Boston. Sept. 2, 1876.

PIG is without special change. The inquiry since the coal auction has been nowise encouraging, A sale of over 500 tons gray forge and mottled iron to one of our Cape furnaces is reported by a New York broker at $19 delivered. This since the auction. The market here is unchanged, holders quoting from $21 to $25 for gray forge to No. 1.

BAR is very dull, the small sales made being on a range of $49 to $54. Little lots of common iron are reported as ordered from furnaces at under $40.

STEEL is listless and continues quoting the same rates as for the past three months, viz.:—American tool 14c@15c.; American Machinery 8½c.@9½c.; Bessemer tires 5¾c.; Sweet's Excelsior Tire, 7¾c ; English Tool, 15½c.; gold.—*Commercial Bulletin.*

Chattanooga, Tenn. Aug. 29, 1876.

Specially reported by J. F. JAMES. pig iron broker, etc., 233 Market Street.

There is little or no change to note in the condition of our market since last report. The stoppage of two of our Southern furnaces will materially affect stocks here.

Tenn. Ala. and Ga. Charcoal, No. 1 foundry		$21@ 22
" " " " No. 2 foundry		20@ 21
" " " " gray forge		17@ 18
" and Georgia coke, No. 1 foundry		18@ 19
" " " " No. 2 foundry		17@ 18
" " " " gray forge		15@ 16
White and Mottled		14@ —
Tennessee and Georgia cold-blast car wheel		23@ 24
Alabama " "		23@ 24
Old Rails	cash	22 00
Cast Scrap	"	12
Wrought Scrap	"	18@ 20

Cincinnati. Sept. 5, 1876.

Specially reported by Messrs. TRABER & AUBERY, commission merchants for the sale of pig iron, blooms, ore, etc.

The demand continues fair, but we have no improvement in prices to report. We quote :

CHARCOAL.

Hanging Rock, No. 1 Foundry	$24 00@25 00	—4 mos
" No 2, "	23 00@	—4 mos
" Mill	20 00@	—4 mos
Tennessee, No. 1, Foundry	23 00@	—4 mos
Tennessee, No. 2, "	22 00@	—4 mos
" Mill	20 00@	—4 mos
Missouri, No. 1, Foundry	@	—4 mos

STONE COAL.

Ohio, No. 1, Foundry	22 00@22 50	—4 mos
" No. 2, "	20 50@21 00	—4 mos
Ohio Mill	19 00@19 50	—4 mos
Missouri, No. 1 Foundry	25 00@	—4 mos
" No. 2, "	24 00@	—4 mos
" Mill	23 00@	—4 mos

CAR-WHEEL.

Hanging Rock, C. B	40 00@45 00	—4 mos
Tennessee "	25 00@32 00	—4 mos
Missouri "	32 00@33 00	—4 mos
Alabama "	25 00@32 00	—4 mos

BLOOMS.

Charcoal	60 00@ 75 00	—cash

SCRAP IRON.

Cast	50c.@ 85	—cash
Wrought	1 00@1 40	—cash

Cleveland, Ohio. Sept. 5, 1876.

Messrs. C. E. BINGHAM & Co., quote as follows :

Per gross ton, on four months' time. Subject to change in market. Discount for cash 4 per cent.

FOUNDRY IRON.

No. 1, Lake Superior Charcoal	27 00@	....
No. 2, " "	26 00@	....
No. 1, Anthracite	25 00@	....
No 2, "	23 00@	....
No. 1, Bituminous	24 50@	...
No. 2, "	22 50@	....
American Scotch, No. 1, Cherry Valley	@	....
" " B—1, " "	@	....
" " No. 2, " "	@	....
No. 1, Massillon	25 50@	....
B—1, "	24 00@	...
No. 2, "	21 50@	...

CAR WHEEL AND MALLEABLE IRON.

No. 3 Lake Superior Charcoal	27 50@	....
No. 4 " " "	27 50@	....
Nos. 5 and 6 "	27 00@	....

BESSEMER IRON.

Nos. 1 and 2 Lake Superior Charcoal	27 00@	....

FORGE IRON.

No. 1, Gray	22 00@	....
White and Mottled	2c 00@	....

Louisville. Sept. 5, 1876.

Specially reported by Messrs. GEORGE H. HULL & Co.

The market is quiet, with only moderate sales.

The usual time, four months, are allowed on quotations below.

HOT BLAST—CHARCOAL.

No. 1 Foundry, from Hanging Rock Ores	$23 00@25 00
No. 2 " " "	22 00@23 00
No. 1, Mill, from " "	20 00@21 00
No. 1, Foundry, from Alabama, Georgia and Tennessee ores	22 00@23 00
No. 2, Foundry, from Ala., Geor'a and Tenn. ores	21 00@22 00
No. 1, Mill, from " " " " "	20 00@21 00

HOT BLAST—STONE COAL AND COKE.

No. 1, Foundry, from Hanging Rock Ores	22 00@23 00
No. 2, " " " " "	21 00@22 00
No. 1, Mill, " " " "	19 00@21 00
No. 1, Foundry, from Ala. Ga. and Tenn. Ores	22 00@23 00
No. 2, " " " " "	20 00@21 00
No. 1, Mill, " " " "	19 00@21 00
No. 1 Foundry, from Missouri Ores	— @ —
No. 2 " " "	— @ —
No. 1 Mill, from Missouri Ores	24 00@25 00

COLD BLAST—CHARCOAL.

Car Wheel from Hanging Rock Ores	35 00@45 00
" " Tennessee "	28 00@30 00
" " Alabama and Georgia Ores	28 00@40 00
" " Kentucky Ores	28 00@45 00

Milwaukee. Sept. 5, 1876.

Iron remains much the same—sales small.

per ton of 2,240 lb.

Frankfort L. S. Charcoal, No. 1	$28 00
" " " No. 2	27 00
" " " No. 3 4 & 5	25 00
" " " No. 6	25 00
Mil. Anthracite L. S., No. 1	27 00
" " " No. 2	26 00
Wisconsin Iron, No. 1	26 00
Mahoning Valley Bit's No. 1	32 00
" " " No. 2	30 00

Richmond, Va. Sept. 6, 1876.

Reported by ASA SNYDER, Esq.

Charcoal pig irons remain, as heretofore, without special activity. Quotations unchanged.

Virginia Cold Blast Charcoal Pig Iron			$27 to $33
" Warm " " "			24 to 28
" " " Coke " "	1 X	23 to 24
" " " " "	2 X	21 to 22
" " " " "	3	20 to 21
" Anthracite 1 X		— to —
" " 2 X		— to —
" " 3		— to —

San Francisco, Cal

From the *Commercial Herald*, Aug. 31, 1876.

We continue to receive free supplies of Scotch pig iron, the bulk of which was placed prior to arrival, thus giving full stocks to our foundrymen without placing any upon the market. The present quotation is entirely nominal. The Oswego Iron Works Company have ceased operations by reason of continued low prices ruling. The market for all sorts of goods in this line seems to be badly demoralized, and in the absence of reported sales it is difficult to give reliable quotations. Of pig iron the present nominal rate is $30@31 for Scotch and English. Tin plate—I.C. coke, 10x14, and 14x20, at $7.50 ; I.C. charcoal $8.50; roofing charcoal, (Terne), 14x20. at $8.25. Sheet zinc may be quoted at at $9½@10c. The ship *Freeman Clark*, for New York, carries 8,812 pigs lead—say 1,030,851 lb.

St. Louis. Sept. 5, 1876.

Specially reported by Messrs. SPOONER & COLLINS, Commission Agents for all kinds of Iron.

Mo. Stone Coal No. 1 Fy.	$25@26	Massillon iron, A No 1	29@30
" " " 2 "	23@24	" " B "	1.31@—
" " Gray Mill,	22½@23	" " "	2.28@—
" Charcoal No. 1, Fy.	23@24	Cold Bl. Car Wheel, Mo.	30@33
" " " 2, "	22@23	" " " Tenn.	30@33
" " Gray Mill,	22@23	" " " Ala.	30@33
Tenn. " No. 1, Fdy	23@24	" " " H. R.	33@35
" " " 2, "	22@23	Mo. Charcoal Blooms	50@65
" " Gray Mill	22@23	" Scrap "	45@55
Va. Coke, No. 1, Fdy.	24@25	" " hammered Billets	75@80
" " " 2, "	23@24	" "Gray Mill,	21@23
H. R. Char. No. 1, Fdy.	25@26	Assorted Bar Iron 2 50, 60 days	
" " " 2, "	24@25	No. 1 Wrought Scrap 90c. cwt.	
" " Gray Mill,	24@25	Heavy cast " 70 "	
		Light " " 50 "	

Montreal. Aug. 29, 1876.

We continue to quote: Pig iron, Eglinton and Clyde, $18@19.00 ; Carnbroe $19@20 ; American $21@23 ; Summerlee and Calder $19@20 ; Langloan and Gartsherrie $20@21 ; Coltness $20.50@21 ; Hematite $26@27. Bar, per 100 lb., Scotch and Staffordshire, $2.05@2.15 ; best do., $2.25@2.35. Swedes and Norway $4.75@5.50 ; Low Moor and Bowling, $6.50@7.—*Monetary Times.*

METALS.

NEW YORK, FRIDAY EVENING, Sept. 8, 1876.

The aggregate amount of business done during the week has not been worthy of notice. Prices as a rule have a weak tendency.

Gold Coin.—During the week under review, gold has ranged from 109¾ to 110, and closed at 110.

Bullion.—Fine silver bars are quoted in London at 51d. San Francisco 15 per cent. discount, and here, 110. Fine gold bar is unchanged at par, to ¼ per cent. discount.

Copper.—About 200,000 lb. have been sold at 18¾c.@19c. There are no indications of an advance in the value of this article, but rather that a further decline will take place, and result in a sale on foreign account. On the 2d inst. Chili bars in London, were quoted by cable at £72, and best selected at £77.

Tin.—Straits in London has declined to £70 10/, while here it has advanced to 17½c. This advance, however, is not likely to be maintained. L. & F. is quoted at 16½c., and Banca, 19¼c.—prices all gold. The business doing is only in a small way.

Tin Plates are in fair jobbing demand at the following gold prices per box: Charcoal tins, $7.12½@7.25, and ternes, $6.50@6.62½ ; coke tins, $6.25, and ternes

$5.87½@6. Messrs. PHELPS, DODGE & Co., announce that they are offering 12x12 and 14x20 plates at the same prices as 10x14, excepting extra stamping plates 12x12 and 14x20.

Lead.—The sales of the week have been very small at 6·20c.@6¼c. gold, the market closing at $6.20@6.25 for ordinary domestic.

Spelter and Zinc.—Domestic spelter is quiet, and weaker. For round lots it may be quoted down to 7c., currency, although for ordinary lots the quotation ranges under 7¼c. Sheet zinc is quoted at 8¼@9c., currency.

Antimony, with a fair business, is quoted at 15¼c@15¼c., gold.

Quicksilver is quoted here at 50@52c.; in San Francisco at 45@47c., and in London (per flask), £8.

The San Francisco *Commercial Herald*, of August 31, says of quicksilver: "Our present available supply is light, yet by reason of the prevailing low price several of our mines have stopped producing, while the New Almaden, which is known to have plenty of rich ore in sight, is not disposed to increase its product so long as present low rates prevail. The demand for the outgoing China steamer is of importance, and several hundred flasks have been sold at 45c., and the same price freely offered for more, the market closing very firm at 45c. Overland shipments to New York aggregate 500 flasks per month."

FINANCIAL.

New York Stocks.

NEW YORK, FRIDAY EVENING, Sept. 8, 1876.

The activity in the coal shares continues, the week's transactions aggregating 336,600 shares. The dealings have been very irregular, and an unsettled feeling pervades the market, the range of the quotations being as variable as they possibly can be.

New Jersey Central Railroad.—The course of this stock has been the feature of the week, the fluctuations ranging from 41¾ to 25, recovering to 31¼, at which it closed to-day, the sales aggregating nearly 93,000 shares. Various false rumors have been set afloat to assist the downward movement of the stock. A contemporary observes with reference to the difficulties of this company. "that they will need assistance to meet obligations maturing at no distant day, and that the recent impairment of their credit will make it necessary to pledge securities before assistance can be got. The question is, have they securities, and will the property stand further mortgages which money lenders would be willing to take? If these questions can be answered in the affirmative, then the company can extricate itself; if not, the wisest course is for the friends of the company to take the initiative and move for and secure a receiver with whom they will be satisfied. The embarrassment of the company is only partly, and that a small part, due to the recent breaking up of the coal combination. When years ago, the management permitted the Lehigh Valley and Delaware, Lackawanna and Western coal carrying trade to be diverted, and to make up for the loss in tonnage, secured the Lehigh and Wilkesbarre coal property, and endorsed $15,000,000 of their bonds, and rented the Lehigh and Susquehanna, guaranteeing one-third of gross earnings, they laid the foundation for their present trouble: and the breaking up of the recent coal combination only brought that trouble to a head.

"The obligations which now press on the New Jersey Central were mainly incurred on account of their efforts to obtain a coal traffic in place of that which had been lost. From that mistake date the troubles of the company, they having been augmented by other actions of management."

The following list of the bonds and stocks issued by the New Jersey Central Company will be of interest:

Stock		$20,525,000	
Bonds—	Mortgage Bonds	5,000,000	7 per cent.
"	Convertible "	4,475,000	"
"	Consol. "	15,000,000	"
"	Newark & N.Y. Bonds	600,000	"
"	L. & W. B. "	10,000,000	6 p. c. gold
		5,000,000	7 p. c. cur.
"	American Dock "	3,000,000	"
"	L. C. & N. Co.'s debt	2,310,000	
"	FR. Car Trust Co. debt assumed	205,793	
	Total	$66,115,793	

There was a report in Wall Street, this afternoon, that the New Jersey Central Board of Direction is to be reorganized, Mr. JOHN TAYLOR JOHNSTON remaining at the head of the board; that a new "blanket" mortgage for $5,000,000 is to be issued; that the money which is to be obtained on this will relieve the company of all embarrassment; and that a statement, showing the condition of the company, is to be issued to-morrow. This report came too late for verification.

Delaware, Lackawanna and Western Railroad.—176,342 shares of this stock have changed hands during the week at from 84⅛ to 77⅞, closing ⅛ above the lowest figure, which is 2 per cent. from our last.

Delaware and Hudson Canal Company. About 9,000 shares changed hands at prices varying from 86, at which it opened to 75¼, at which it closed to-day. Should the N. J. Central go into the hands of a receiver the effect on the other companies would probably be very injurious. There is no more formidable rival than a bankrupt who has no interest to pay and can live when earning only running expenses.

Quotations and Sales of Stocks and Bonds.

For the week ending Sept. 8, 1876.

STOCKS.

	Highest	Lowest	Closing	Shares sold.
Pennsylvania Coal Co	—	—	230	—
Consolidation Coal Co	39⅜	39	38	700
Spring Mt. Coal Co	—	—	*55	—
American Coal Co	—	—	*54	—
Maryland Coal Co	—	—	13½	—
Del., Lack., and West. RR. Co	84½	77⅞	78¼	176,342
New Jersey Central RR. Co	41¾	25	31¼	149,153
Delaware and Hudson Canal Co	86	75	75⅞	9,825
Quicksilver Mining Co. pref'd	18½	18½	18	100
" " " Common	—	—	13¼	—
Mariposa Land & Min. Co. pref'd	7	5½	6	410
St. Louis & Iron Mountain RR	15½	15⅜	13	100
Lehigh & Wilkes-Barre Coal Co	—	—	—	—

Total Shares sold... 336,630
Sales for the week previous... 383,013
Decrease... 46,383

* Nominal.

BONDS.

	Inter'st	Sales.	Price.
Del., Lack. & West. 2d M	M. & S.	.....	.... @109⅜
" " " 7's Con'ble	J. & D.	.....	.... @ ....
Cent'l RR. of N.J., 1st M., New	F. & A.	14,000	109¾@112
" " " 1st Cons	.....	150,000	86 @ 98
" " " Convert'le	M. & N.	75,000	74½@ 87
Lehigh & W.-B'e, Con. Guar'd.	.....	48,000	60 @ 71½
Am. Dock & Imp. Mt. Bonds	J. & J.	.....	.... @ 94½
Del. & Hud. Can., 1st M., 1891	.....	3,000	.... @111⅜
" " " 1884	.....	22,000	105 @106
" " " 1877	.....	13,000	103¾@103½
" " " Coup. 7's, 1894	.....	.....	.... @108¾
" " " Reg'd 7's, 1894	.....	.....	.... @ ....
St. L. & Iron Mountain, 1st M	F. & A.	8,000	98 @ 101
" " " 2d M	M. & N	.....	.... @*79
Chesapeake & Ohio 6's, 1st M.	.....	5,000	.... @ 27
" " Ex. Coupon	.....	.....	.... @ ....
Mariposa Gold Loan con. 7s	.....	.....	.... @100⅝
Total sales		$338,000	

* Nominal.

Philadelphia Stocks.

PHILADELPHIA, Thursday Evening, Sept. 7, 1876.

THE quotations of Philadelphia coal stocks, with but a single exception indicate an improvement. The market has been generally steady during the week, with a falling off in sales of some 70,000 shares.

Pennsylvania Railroad.—This closes at 48⅛, an advance of 1⅜ from our last, equivalent to 2¾ per cent. 61,321 shares comprise the transactions. The lowest point attained during the week was on the 4th inst., when the stock sold down to 47⅛, on sellers option of 30 days.

Reading Railroad.—The dealings in this stock have been very much restricted during the week, the total transactions amounting to only 5,216 shares. The steadiness in this stock continues. An advance to 44⅛ equal to one per cent., has occurred in the price, as compared with our last.

Lehigh Valley Railroad stock is unchanged; the dealings during the week amounted to only 2213 shares, the range of prices being confined within one per cent. On the 1st instant two railroads in the State of New York, connecting with the Lehigh Valley Railroad by way of the Pennsylvania and New York Canal and Railroad, were sold at auction, Judge Packer, President of the Lehigh Valley Railroad Company, being the purchaser of both for his company. The first was the Ithaca and Athens Railroad, extending from Athens to Ithaca, thirty-six miles, the sale being under foreclosure of a second mortgage, and subject to the lien of a 7 per cent. first mortgage of $600,000 and its three unpaid semi-annual coupons. The price at which it was bid off was $60,000. The second road, sold the next day, on the 2d of the month, was the Geneva and Ithaca, forty miles long. This road was sold under a first mortgage; and, without competition, was knocked down upon the single bid of $50,000. The prices at which these respective properties were sold afford little idea of their actual worth, as, for instance, the iron on the Geneva and Ithaca, is, of itself, said to be worth a quarter of a million of dollars. The Ithaca and Athens Road has a paid in capital of $980,600, and a funded debt of $606,000. The Geneva and Ithaca has a funded debt of $800,000, the two roads being represented by $2,835,056 of debt and capital, and cost in construction and appurtenances $2,467 282. The Lehigh Valley Railroad Company has held a controlling interest in the two roads named for some time: and the sales noted were more matters of form than of substance, indicating values of the property passing under sale. The sales above noted, it is expected, will be approved on the 18th instant, and the titles they convey at once thereafter be passed. The unpaid coupons will be paid by the Lehigh Valley Railroad Company, and regularly hereafter as they mature.

Lehigh Coal and Navigation Company.—This stock has suffered a marked decline during the week, the closing quotation of 29 being 3 points, or 6 per cent. below our last. The sales have been comparatively large, amounting to over 26,000 shares, a number of sales have been made as low as 27½, equivalent to a percentage value of 55. This exceptional movement in this stock is accounted for on the theory of its intimate connection with the New Jersey Central Railroad. It is probable, that if the latter company is forced into bankruptcy that the shares of the Lehigh Navigation Company will go still lower.

Bonds have sold to the extent of $100,000 in excess of sales in our last. The Lehigh Coal and Navigation Company's issues are considerably lower, with which exception we observe but little change.

Philadelphia and Reading Railroad.—This Railroad Company has given orders to build ten new palace cars at the Reading shops for the through lines of the company from Philadelphia to Williamsport and other points. The cars are to be furnished with magnificent reclining chairs and are to be fitted up first-class in all their appointments.

Northern Central Railroad.—Thirty new coal hoppers of an improved pattern were despatched from the Harrisburg Car Company's yard last week for this company. The State Line Road is progressing fast, about eight miles being laid on the Elmira end. The Northern Central is laying the third rail for the broad-gauge from its junction with the "State Line" at Elmira.

Florence Iron Works, Burlington County, N. J.—66 shares of this stock sold at auction on the 5th inst. at $50 per share, the par value being 100.

Susquehanna Coal Company.—$3,000 of the 6 per per cent. bonds of this company were sold at auction on the 5th inst. at 75⅓ per cent.

Quotations and Sales of Stocks and Bonds.

For the week ending Sept. 7, 1876.

STOCKS.

	Highest	Lowest	Closing	Shrs
Lehigh Valley RR. Co	53¾	52½	53	2,213
Pennsylvania RR.	48⅝	47¾	48¾	61,321
Reading RR.	45¼	43⅞	44	5,216
Lehigh Coal and Nav. Co	32¾	27½	29	26,170
Penn. Canal	—		*9	—
Buck Mountain Coal Co	—	—	*25	—
Fulton Coal Co	—	—	*3½	—
Locust Mountain Coal Co	—	—	—	—
Westmoreland Coal Co	—	—	85	—
St. Nicholas Coal Co	—	—	*1	—
Cambria Iron Co	15¾	15½	15½	65
Crane Iron Co	—	—	*25	—
Emaus Iron Co	—	—	—	—
Pennsylvania Salt Manufact. Co	72	71½	71½	42
Total shares sold				95,027
Sales for the week previous				166,126
Decrease				71,099

* These quotations are nominal.

BONDS.

	Sales.	Price
H. and B. T. RR. 1st mortgage, 7s	—	— @107
" " " 2d " "	—	— @102
" " " 3d " cons	—	— @ 43
Lehigh Valley RR. Con. mtg. 6s	11,000	99¾@100
" " " 7s, 1910	25,000	110½@111
" " " 6s Reg	1,000	108¼@—
" " " 1st M. 6s coup	—	— @106
Pennsylvania RR. 1st mtge. 6s	—	— @106
" " gen. " con. 1910	2,000	— @107
" " gen. " 6s, reg	—	— @107½
" " Cons. M. 6s reg	—	— @ 99½
Phil. & Reading RR. 7s '93	—	— @109
" " " G. M. 7s, reg	—	— @107
" " " 7s cou	6,000	— @107¾
" " new convertible 7s	11,800	96 @ 98⅜
" " 6s 1880	—	— @102⅝
" " debenture 6s	8,000	78 @ 78⅛
Phil. & Reading C. & I. Co. Deb. 7s	—	— @—
" " Tamaqua & Swatara tract.	18,000	— @ 80
Lehigh Coal & Nav. Co., 6s '84	12,500	102 @102½
" " " RR. 6s, '97	10,800	101 @102
" " " 6s, '77	—	— @ 97
" " " 6s gold loan	65,500	95 @ 99
Penn. Canal, 6s	7,000	71½@ 71¾
Penn. and N. Y. Canal, 7s	1,000	— @109¾
Ches. and Del. Canal, 6s	—	— @ 85
Susquehanna Canal, 6s	—	— @ 70
Delaware Division Canal, 6s	—	— @—
Susquehanna Coal Co. 6s	—	— @ 77
Buck. Mount Coal Co. 6s	—	— @—
Penn. Gas Coal Co. 6s	—	— @—
Honeybrook Coal Co. 7s	—	— @—
Total amount of sales	$179,600	

Closing quotations, in the absence of sales, represent the latest prices bid.

Gold and Silver Stocks.

NEW YORK, FRIDAY EVENING, Sept. 8, 1876.

MINING shares, with one or two exceptions, are lower, the decline ranging from $1 to $6 per share throughout the list.

Ophir.—An advance of $3 per share in this stock is the most notable exception to the general downward tendency of the list. The superintendent's report of the bullion product of this company for the month of July, as taken from the San Francisco *Bulletin*, is as follows:

Mills.	Tons.	Assay.	Bullion.
Nevada	2,200	$42.66	$51,162.35
Empire	1,609	42.78	37,862 16
Mexican	3,900	40 50	95,465.42
Winfield	1,350	42.09	41,395.65
Totals	9,059		$225,885.58

The ore crushed by the Nevada mill averaged $23.24 per ton, or 54⅛ per cent. of the assay value; that of the Empire mill $23.53 per ton, or 55 per cent. of the assay value; that of the Mexican mill $24.47 per ton, or 60½ per cent. of the assay value; that of the Winfield mill $42 per ton, or 73 per cent. of the assay value. Our correspondent raises two queries in connection with the foregoing—first in relation to the difference in returns of the mills, and second, in relation to the great difference between the assay value and actual yield. The first is, of course, susceptible of explanation by the character of the ore delivered to the mills, which permits one mill to return 73 per cent. and another 54⅛ per cent. of the assay value. But the average percentage of the four mills combined is considered far below what ought to be realized from the assay value of the ores delivered, and it is suggested that the ore must be very rebellious, or that it is not properly worked. As the mill owners generally come in for the tailings, it is, of course, for their advantage to have them pan out well. The 9,059 tons of ore worked at the Ophir mine last month give an average yield of $24.93 per ton. The average for June was $33, and for May $46.

California.—Daily yield, 700 tons of ore. The ore breasts at all points are showing unusually fine. The ore is rich in every quarter of the mine. The bullion

yield which promised at one time to considerably exceed that of July will probably reach $2,000,000, the amount having been greatly lessened by some necessary repairs to the mills and a delay in hoisting ore through the Ophir shaft caused by the breakage of a cable. The usual dividend may be looked for, although a surplus sufficient will be placed in the treasury by that time to more than double it if the management so desire. The south drift on the 1,600-foot level has penetrated the ore body a distance of 155 feet, the face of the drift still in the richest character of ore. The new mill should have been in complete order for starting before now. The flow of water at the bottom of the C. and C. shaft is still very strong, averaging about forty-five inches, miner's measurement. The pump has been running at the rate of ten strokes per minute for the past five days, and has about all the work that it can do. Sometimes the flow will slacken so as to allow of sinking the shaft from ten to thirty feet, when a crevice will be opened and the workmen again drowned out of the shaft. It will then take three or four days to reduce the water sufficiently to again begin work, when the same operation will be repeated.

Consolidated Virginia.—The repairs are completed and the shaft sunk to the 1550-foot level, where a large and commodious station is being opened. As soon as this station is completed, which will be at a very early date, the extraction of ore will be resumed with fair prospect of a long and prosperous run. The extraction of ore has been necessarily light owing to the interruption caused by the shaft repairs, and the want of milling capacity, for the past month. This, however, will make no difference in the payment of the regular monthly dividend, as the reserve now in the treasury is amply sufficient to more than pay all expenses and make the usual dividend also. The mine is in fine working condition at every point. The new mill is nearly ready to start up, so that when the extraction of ore is resumed, there will be no impediment to the successful taking out of any desirable amount. No work is being done in the north drift on the 1700-foot level.

The Company are extracting some 200 tons of ore per day, through the GOULD and CURRY shaft. The usual dividend of $2, per share has been announced, payable on on the 11th inst.

Yellow Jacket.—The south drift on the 2040-foot level from the bottom of the south winze is in a distance of 77 feet, the face in dry porphyry, with quartz seams running to the southeast and carrying some ore. The crosscut from this drift 50 feet south of the winze is in 26 feet, the face in the same character of ground as that in the south drift. The main south drift on the 1740-foot level, running to connect with the Crown Point Mine, has passed through the Kentuck, and is now in the Crown Point ground. Retimbering the south winze between the 1740 and 1940-foot levels is completed. Sinking this winze will be resumed as soon as a water tank on that level can be constructed.

Crown Point.—Sinking the main incline is making good progress and will have but a few feet more to sink to reach the 1800-foot level. The north drift on the 1700-foot level, running to connect with the south drift from the Yellow Jacket Mine, is making good progress and affords no new features. The main south drift on the 1700-foot level is rapidly advancing, the face still in quartz and low grade ore. It now has only about 40 feet more to run to reach and connect with the new Belcher air-shaft.

Gould & Curry.—The work on the main shaft is still the feature of the operations in the mine, it is steadily progressing. Sinking the Combination winze on the Savage line is making fair progress. It is now down 300 feet, the bottom inhard blasting rock. The south drift on the 1700-foot level is in 75 feet, and is also making good headway. The erection of the new machinery is going rapidly ahead.

Sutro Tunnel is now in 14,105 feet. The header in porhry rock. Water.—Quantity, 160 miners' inches. Temperature—At mouth, 77 deg.; at shaft No. 1. 80 deg.; at shaft No. 2, 81 deg.; at header, 85 deg. Air—Temperature—At mouth, 80 deg.; at shaft No. 1, E., 82 deg.; W., 78; at shaft No. 2, E, 83 deg.; W., 84; at header, 86 deg.

Boston Hydraulic Gold Mining Company.—This company has declared a dividend of 3 per cent. payable on demand.

The Hukill Silver Mining Company of Colorado has declared a monthly dividend of 1 per cent., payable September 11, in New York city.

QUOTATIONS:

	No. of feet on Vein.	No. of shares.	Sept. 1.	Sept. 8.
Sierra Nevada ...	3,300	100,000	$14	$15
Union Consol'd..	000	100,000	14	14
Mexican.....	600	108,000	34	35
Ophir.....	675	108,000	56	59
California.....	600	540.000	59	59
Consol'd. Virginia	710	540,000	58	57
Best & Belcher...	540	100,800	49	49
Gould & Curry..	612	100,800	16	15
Savage	771	112,000	21	21
Hale & Norcross.	400	112,000	13	12
Chollar Potosi	1,400	28,000	93	94
Alpha Consol'd...	306	30,000	53	47
Imperial Con....	468	500,000	5	5
Yellow Jacket...	957	120,000	31	27
Kentuck	95	30,000	14	13
Crown Point ...	541	100,000	12	11
Belcher	1,040	104,000	25	22
Overman	1,200	38,400	73	72
Caledouia	2,188	100,000	8	8
Justice	2,100	105,000	28	22
Raymond & Ely..	5,000	30,000	7	5
Meadow Valley...	4,400	60,000	1	*
Eureka Consolid..	....	50,000	13	13
Eureka G. V.....	1,680	20,000	3	*
Silver Hill.....	5,400	54,000	11	9
Julia.....	3,000	110,000	9	8

* We have no quotations of these stocks for this week.

Copper Stocks.

Specially reported by Messrs. WILSON W. FAY & Co., Bankers and Brokers, Room 7 Traveller Building, 31 State Street, Boston.

BOSTON, THURSDAY EVENING, Sept. 7, 1876.

Allouez is 7, bid, the first public bid for several weeks. Calumet holds steady at 160½, with very few sales. Copper Falls is better, at 3⅛ bid. The company has lately received very encouraging letters from the mine. Duncan Silver is strong at 4⅛ bid. There is very little stock floating, most of it being held by the clique, who are the buyers of it. At present figures International is in demand at ·35, and with Duncan 4⅛, ought to bring double that price. The International is right alongside of the Duncan, nothing but a wall separating them, and their prosperity (to a more or less degree) is identical. Pewabic is stronger at 3⅛, bid, an advance of 50c. Quincy strong at 42¾, bid.

DESCRIPTION.	Par Value.	No. of Shares.	CLOSING. Bid.	Asked.
Allouez.....	$50	20 000	$ 7 00	$ 8 00
Calumet and Hecla...	25	80,000	160 50	161 00
Central.....	25	20,000	30 00	31 00
Copper Falls.	50	20,000	3 50	3 75
Dana.	25	20,000	9	12½
Franklin	25	20,000	11 75	12 25
Humboldt.....	25	20.000	10	12½
Madisca.....	25	20,000	27	30
Mesnard	25	20,000	30	37½
Minnesota.....	25	20,000	1 25	1 50
National	15	20,000	1 25	1 50
Osceola	25	40,000	21 00	22 00
Petherick.....	25	20,000	37½	50
Pewabic	25	20,000	3 50	3 75
Phenix	25	20,000	12 25	12 75
Quincy.....	25	20,000	42 75	43 25
Ridge.....	25	20,000	4 50	5 00
Rockland	25	20,000	25	30
International Silver.....	20	60,000	35	40
Star	25	20,000	37½	50
Superior.....	25	20,000	10	12½
Duncan Silver	20	60,000	4 50	4 62½

Gas Stocks.

NEW YORK, FRIDAY EVENING, Sept. 8, 1876.

We observe a slight improvement in the demand for the stock of some of the New York Companies and in some instances we slightly advance the quotations. The general market however is unchanged as compared with our last report.

The Citizens Gas Company of Long Island. N. Y. has failed and is in the hands of a receiver.

The People's Gas-Light Company of Albany, N. Y. has made a contract to furnish the village of West Troy with gas. The contract provides for furnishing that village with twelve millions feet of gas annually.

Chicago Gas Companies. The Chicago Common Council have passed a resolution abrogating the existing contracts between the city and the Gas Companies and requiring the companies to supply Gas at $1.50 per 1,000 feet. An ordinace was adopted granting a franchise to the Consumers' Gas light and Coke Company. A series propositions from Messrs. AIKEN and CHARLES were presented to light the streets with oil at the rate of $14 per lamp, for a light equal to a three-foot burner, $16 for the equivalent of a four foot-burner, and $18 for a five-foot burner. These gentlemen proposed to put up fifty lamps in some central part of the city, with a view demonstrating the advantages offered by their plan. The proposiwas referred to the committee on gas.

Lancaster, Pa.—A new gas company to manufacture gas under the "Lowe Process," is being organized at this place, it is proposed to supply gas at $2 per thousand feet.

Reno, Nevada, Gas Works.—It is probable that Reno will soon be supplied with gas. A capital stock of $25,000 is required, and of this $20,000 is already pledged. The stock was divided in five shares of the par value of $5,000.

Sorel, Quebec, Gas Works The gas works in this place are almost completed, and in a short time the corporation and townspeople expect to enjoy the full benefit of their enterprise in constructing the works.

Baltimore, Md., Gas Company.—The September coupons on the bonds of this company will be paid on presentation in New York.

Boston Gas Company.—Recent sales of the stock of this company have been made at $790 per share.

The following list of Companies in New York and vicinity are corrected weekly by GEORGE H PRENTISS, Broker and Dealer in Gas Stocks, No. 30 Broad st., N. Y.

Quotations "bid" and "asked" of New York City and Vicinity Gas Companies are on the $100 of stock and not on one share.

Companies in New York and Vicinity	Cap. Stk.	Par.	last Di-vid.	When Paid.	Bid.	Askd.
			pr.c			
Mutual, N. Y.....	$5,000,000	$ 100	2½	Jan. '76	110	111
" " Bonds	90,000	1,000	†3½	Feb. '76	102	
NewYork, "	4,000,000		5	Jan. '76	140	142
Metropol. "	2,500,000	100	5	Mar. '76	145	147½
" " Certf.	1,000,000	....	3½	"	101	102½
" " Bonds	500,000	1,000	3½	Jan. "	102	102½
Harlem "	1.850,000	50	4	Feb. '76	110	114
Manhattan"	4,000,000	50	10	July "	242	245
Brooklyn, B'klyn	2,000,000	25	5	June '76	180	185
Nassau "	1,000,000	25	4	Jan. '76	75	80
" "Certf.	700.000	1,000	3½	Nov. '76	95	98
People's "	1,000,000	10	3½	Jan. '76	49	50
" "Certf.	300,000	1,000	3½	Jan. '76	80	85
" " Bds	325,000	....	3½	Feb. "		95
Metropol. "	1,000,000	10	3½	Nov. '75	73	74
Wmsburgh "	1,000,000	50	5	Jan. '76	130	135
" "Certf.	1,000,000	....	3½	Jan. "	100	102
Citizen's "	1,200,000	20	2½	Jan. '76	90	95
" "Certf.	320,000	1,000	3½	April "	100	102
J. C. N.J.....	386,000	20	5	July,'75	160	—
Centl. Westch. N.Y.	466,000	50	4	July. "	95	100
ubur'n " "	390,000	50				95

† Gold.

Companies out of Town.*	Cap. Stk.	Par	Bid	Askd.
People's " " of J. C....			120	133
¶Citizen's G. L. Co., New'k. N.J.	1,095,000	50	85	90
Perth Amboy G. L. Co., N. J....		25		90
Hempstead" " L. I., N.Y.	40,000	100		100
Jamaica, " " " "	25.00	100		100
Richmond Co., S. I. "	300,000		100	105
Citizens', Rochester, "		100	45	50
Rochester Gas Co., "		100	50	
‖People's G. L. Co. Albany,"	1,000,000	100		20
§Mutual " Buffalo"	750,000	100	48	55
Mutual " Detroit Mich.		50	18	
Troy G. L. Co., Troy, N. Y.....			108	
Citizens " "	600,000	100		100
Brockport, N. Y., G. L. Co.	25,000	100	60	80
Saugerties G. L. Co.....	15,000	100	100	115
†Baltimore G. L. Co., Balt., Md	2,000,000	100	155	165
St. Louis G. L. Co., St. Louis, Mo	600,000			100
People's G. L. Co., Balt., Md	2,000,000	25	24½	25⅞
Hannibal G. L. Co., Hanni., Mo.	100,000	100	95	100
La Clede, St. Louis, Mo	1,200,000	100		102
Lewiston G. L. Co., Lewis., Me	400,000	100	50	85
Chicago G. L. Co., Chicago, Ill.	2,000,000	100	125⅜	
Jacksonville, Ill.....	120,000	100	82	
‡Lima, Ohio..... ...	60 000	100	10	
Derby G. L. Co., Derby, Conn..	160,000	100	60	80
Woonskt G. L. Co. Woonskt, R.I.	150,000	100	100	
Fort Wayne G. L. Co. F. W., Ind		100	90	100
North. Liberties G. L. Co. Phila.		25	29	
Wilkes-Barre G. L. Co W. B. Pa.		50	70	
Washington G. L. Co., Phila....			42	43
Pottsville, Pa. Gas Co		50	40½	
Portland G. L. Co. Portland, Me	350,000	50	72	75
Hartford G. L. Co., Hartford, Ct	700,000	25	41	
Boston G. L. Co., Boston, Mass.	2,500,000	500	785	790
East Boston, Mass		25	132	
Chelsea G. L. Co. Chelsea, "	300,000		139	
Cambridge G. L. Co., Cam., "	700,000		132¾	
Louisville G. L. Co., Louis., Ky.			127	
Cincinnati G. L Co , Cincin, O..				200
Carondelet G. L. Co , Mo .		50		6⅛
S. F. G.L. Co. San Francisco, Cal	10,000,000	100	102	
Stillwater G. L. Co., Minn... .	50,000	50		26
City G. L. Co. Montreal, Can....	1,440,000	40	167	169
Consumers G. L (old.) Tor., Ont	600,000	50	134	
Hamilton G. L. Co., Ont.....	150,000	40	112½	
Halifax G. L. Co., Halifax, N.S..	400,000	40		147¾

* These quotations represent the latest obtainable prices at which sales were made.

† This Company has issued $1,000,000 in certificates in addition to their stock indebtedness, on which they pay interest at the rate of 6 per cent. gold.

‡ This Company has $30,000 in bonds outstanding.

§ $200,000 represents the bonded indebtedness of this Company.

‖ $350,000 of the indebtedness of this company is represented by bonds.

¶ $124,000 of the indebtedness of this company is represented by bonds; also $53,000 in certificates, which is included in the aggregate stock debt quoted.

THE COLLIERY GUARDIAN,

AND

Journal of the Coal and Iron Trades.

A General Commercial Newspaper,

Published Weekly, in time for Friday Evening's Mail. Price, 5d.; Stamped, 6d.; Per Annum, 21s.; Stamped, 26s.

This Newspaper was established in the year 1860, for the specific purpose of representing the Coal and Iron Trades of Great Britain, and of promoting the interests of the gentlemen engaged therein.

It is the property of a large and influential company of Colliery Proprietors and Ironmasters, who represent many of the largest and most important coal and ironworks in the Kingdom.

It is the recognized Organ of the Coal and Iron Trades, having the cordial approval and sanction of the Mining Association of Great Britain, the North of England Institute of Mining Engineers, the South Lancashire and Cheshire Coal Association, the Midland Institute of Mining Engineers, the South Staffordshire and East Worcestershire Institute of Mining Engineers, the Coal and Ironmasters' Association of Scotland, etc., etc.

Its subscribers comprise nearly all the proprietors, managers, and agents of collieries and ironworks in the United Kingdom, and include also a very large proportion of the upper class of officials entrusted with the management of the various departments of coal mining and iron making. It also circulates largely amongst gentlemen engaged in scientific pursuits and in the various branches of manufacture and commerce.

OFFICES:

5 BOUVERIE STREET, FLEET STREET, LONDON.

W. M. HUTCHINGS, Publisher.